



*University of Pennsylvania*

---

*Annenberg Rare Book  
and Manuscript Library*


LIBRARY  
UNIVERSITY OF  
PENNSYLVANIA



*Rittenhouse Quarry*

*VB 619.15*  
*P413a*

FAIRMAN  
ROGERS  
COLLECTION  
ON  
HORSEMANSHIP



Digitized by the Internet Archive  
in 2009 with funding from  
Lyrasis Members and Sloan Foundation









## PLATE XI.

Forming the Frontispiece to Part II, Vol. IV.)

### WINDGALLS.

In this plate is represented the near hind leg of the horse, cut off below the hock, inclined a little in its position so as the more fully to expose to view its outer side: the windgalls formed in it showing rather more development on that than on the opposite side.

Two of these tumours (*a* and *b*) are apparent in it in the usual situation, viz. a little above the fetlock. One of them (*a*), which is cut open to expose its interior, is seated about a couple of inches higher than the sesamoid bones, being there lodged in front of the perforatus tendon (*d*) in the interspace between it and the perforans tendon (*e*); which latter seems as though it actually ran through the cavity of the windgall, owing to the circumstance of the bursa having natural attachments around the borders of the tendon. At the time it was cut open this windgall contained full half an ounce of albuminous fluid, of the aspect and consistence of white of egg, excepting that it was of a beautifully bright, pale yellow colour, as the stain it has left upon the tendon (at *e*) fully indicates. Its character was truly synovial.

The other fetlock windgall (*b*), situated half an inch lower down, is lodged in front of the perforans tendon, between it and the suspensory ligament (*f*), whose bifurcations afford a habitation for it (at *g*). In its unopened state the windgall assumes the ordinary bluish or greyish cast windgalls, viewed through their parietes, ordinarily present.

The windgall-looking-like cavity within the hollow the heel (*c*), though in the subject from which the drawing was taken no more than a healthy bursa, represents well enough the seat of "windgall of the heel," as described as a rare and hitherto undemonstrated cause of lameness, at p. 308.



LAMENESS  
IN  
THE HORSE:  
WITH COLOURED PLATES,  
ILLUSTRATIVE OF THE DIFFERENT SPECIES OF LAMENESS.

---

By WILLIAM PERCIVALL, M.R.C.S.,  
VETERINARY SURGEON OF THE FIRST LIFE GUARDS;  
LICENTIATE OF THE APOTHECARIES' COMPANY;  
EDITOR OF 'THE VETERINARIAN;' AND  
AUTHOR OF 'THE ANATOMY OF THE HORSE,' 'LECTURES ON HORSES,' ETC.

---

BEING PART II, VOL. IV, OF THE AUTHOR'S 'HIPPOPATHOLOGY,'  
OR, 'TREATISE ON THE DISEASES AND LAMENESSES OF THE HORSE,'  
NOW COMPLETE IN FOUR VOLUMES,  
WITH A COPIOUS INDEX TO THE ENTIRE WORK.

---

"LAMENESS KEPT ME AT HOME."

*Sir Kenelm Digby's Answer to Pope.*

---

LONDON:  
LONGMANS, GREEN, READER, AND DYER,  
PATERNOSTER ROW.

---

1871.

(VR)

NEW BOLTON  
CENTER

619.15

P113a

v. 4, pt. 2

# CONTENTS OF PART II, VOL. IV,

OF

## 'HIPPOPATHOLOGY.'

### CLASS I (continued).

	PAGE
Diseases of the bursæ mucosæ and synovial sheaths .....	273
Windgall .....	274
origin of .....	276
in young horses .....	277
in old or worked horses .....	ibid.
The causes of windgalls .....	279
The pathology of windgall .....	ibid.
Windgall rarely productive of lameness.....	283-290
The site of windgall .....	ibid.
The treatment of windgall .....	284
by puncturation .....	288
by seton .....	289
Windgall of the fetlock .....	290
seat of .....	292
morbid changes .....	293
treatment of.....	ibid.
Bog spavin .....	294
difference between it and bone spavin .....	295
causes of .....	ibid.
difference between it and windgall.....	296
treatment for .....	299
Blood Spavin .....	ibid.
a common accompaniment of bog spavin .....	300
Thorough-pin .....	301
causes of.....	302
pathology of .....	ibid.
treatment of .....	304
Windgall of the tendo Achillis.....	ibid.
treatment of.....	305
Windgall of the knee .....	ibid.
a different kind of .....	306
Windgall in front of the fetlock .....	ibid.
Windgall of the knee .....	308
Capped hock.....	309
causes of .....	313
treatment, prophylactic, for.....	ibid.
Fetters to prevent horses kicking in their stalls .....	317
Medical treatment of capped hock .....	318
Capped elbow .....	322
cause of.....	324
cure or removal of.....	ibid.
Capped knee.....	326
cause of.....	327
treatment of.....	328

### CLASS II.

Lameness arising from disease of muscle of tendon.....	331
Curb .....	332
nature of .....	334



	PAGE
Curb, cause of .....	337
— treatment of .....	339
Sprain of the flexor pedis tendon of the hind leg .....	343
— of the flexor metacarpi tendon .....	344
— of the flexor metatarsi tendon .....	ibid.
— of the flexor tendons ( <i>or clap of the back sinews</i> ) .....	346
Severe sprain, or "Broken down" .....	350
The treatment of sprain .....	353
— of severe sprain .....	355
Sprain of the suspensory ligament .....	357
— of the fetlock joint .....	359
Tenotomy ( <i>division of the flexor tendons</i> ) .....	362
Lameeness from laceration or rupture of muscular fibre .....	371
Rupture of the flexor metatarsi .....	374
— of the gastrocnemius muscle .....	375
Shoulder lameness .....	381
Stringhalt .....	384

## CLASS III.

General observations on the diseases of the foot .....	389
Laminitis ( <i>fever in the feet, or acute founder</i> ) .....	390
Acute laminitis .....	394
— symptoms of .....	395
— diagnosis of .....	398
— causes of .....	399
— metastasis of .....	401
— terminations of .....	403
— treatment of .....	408
Sub-acute laminitis .....	418
Pumice foot .....	424
Frush ( <i>commonly written "Thrush"</i> ) .....	429
— pathology of .....	434
— treatment of .....	436
Canker .....	441
— symptoms of .....	443
— causes of .....	446
— pathology of .....	447
— treatment of .....	449
Contraction ( <i>or hoof-bound</i> ) .....	458
— causes of .....	460
Pure and mixed contraction, difference between .....	465-6
Prevention of contraction .....	467
Treatment of contracted feet .....	469
Sanderack .....	473
Toe sanderack .....	476
Treatment for sanderack .....	478
Corn .....	483
— cause of .....	484
— pathology of .....	486
— treatment of .....	488
— prevention of .....	491
Seedy toe .....	492
— pathology of .....	495
— treatment of .....	497



# HIPPOPATHOLOGY.

---

## VOL. IV.—PART II.

---

### DISEASES OF THE BURSAE MUCOSÆ AND SYNOVIAL SHEATHS.

No person having any pretension to anatomical knowledge need be told that the parts named, or rather misnamed, by the old anatomists BURSAE MUCOSÆ, are not bags of *mucus*, but bags containing a fluid similar in its aspect and properties to *synovia* or joint oil; and that the sheaths of tendons, “the synovial sheaths” as they are usually called, are kindred structures to them. The bursa mucosa consists simply of a membrane, of the same texture as synovial membrane, thrown into the form of a sac or bag. The synovial sheath nothing differs from it save that the membranous sac is commonly prolonged and enlarged, and is apt to run into divers complex and irregular shapes. Both bursa and sheath form circumscribed inclosures; and in this respect both bear considerable analogy, as well as in the texture of their membranous walls, to the shut cavities of the joints. Dr. Alexander Munro\* satisfactorily established the identity in structure, sensibility, and disease, between the bursæ and the capsular ligaments of joints. He found the membrane composing one and the other thin and dense, and possessing little sensibility in health, but great sensibility in a state of inflammation; and, though transparent in the bursa, as capable as the capsular ligament of confining air or any other fluid. That the cavity of the bursa should be shut, the same as that of the joint, and

\* In that section of his works entitled, “A Description of all the Bursae Mucosæ of the Human Body.” Edinburgh, 1785.

secluded through the density of its parietes from all around, appears requisite, not merely that it may retain the fluid secreted into it, but that no other fluid, not even air, may gain admission into it; the presence of air being found, the same as in joints, to derange its secretory function, and create inflammation. Hence it is that an opened bursa or tendinous sheath is regarded in much the same light as an opened joint, or, at all events, as a case calling for more medical skill and attention than any flesh or skin wound of the ordinary description.

BURSAL AND THECAL STRUCTURES, being appendages to the locomotive apparatus, are regulated in their number and distribution by the amount or extent of motion particular parts of the body possess. This accounts for the bursæ and sheaths of tendons being met with exclusively in the limbs; also for those in the horse, in particular, as an animal forced into speed and labour under heavy burthens, coming so frequently under our notice in states of derangement or disease: the form such deranged or morbid condition assumes being usually that of, what is called,

#### WINDGALL.

Such an appellation naturally leads anybody to suppose that “wind” must constitute the swelling known as *windgall*; whereas, in point of fact, it is a bursa filled to distention (not with *wind*, but) with the same kind of synovial fluid of which it contains, for the due performance of its function, but a comparatively small proportion in a state of health.

THE SYNOVIAL (AND BURSAL) MEMBRANES IN DISEASE exhibit phenomena analogous to those of their correlative tissues, the serous membranes. Under inflammation—or under even simply increased vascular action—we know how prone the serous surfaces are to emit serous fluid in unnatural quantity, and coagulated lymph along with it. The same propensity brought into action by similar causes is manifested by the synovial and bursal membranes. But the synovial is not equally disposed with the serous structure to run into the adhesive inflammation. Effusion of lymph does occur, but not so often, in joints and bursæ. Rheumatic inflammation of joints is one example of it; the intense inflammation which now and

then supervenes on severe broken knee, another. We have seen the entire surface of the synovial lining of a joint thickly coated with coagulable lymph. And effusion of solid matter is not confined to joints, but, on occasions, happens in bursal and thecal cavities as well. The usual, or ordinary form, however, and we may add the simplest form, under which disease of bursa presents itself is that of *windgall*.

THE NAME OF WINDGALL is a remnant of barbarous veterinary nosology. Derived from the words *wind* and *gall*, the "corrupt jelly" or black-looking matter which chronic windgalls are now and then found to contain, appears to have been called "gall," not from any resemblance it was thought to bear to bile, but merely from its rancorous malignant aspect. The old writers on farriery entertained notions, from the puffy fluctuating sensations the tumours upon the legs of horses convey to the feel, that they contained, as well as other matters, "wind" or *flatus*. By Vegetius, the skin covering the tumour was said to be "inflated after the similitude of a bladder;" and Bracken defined the windgall to be a "windy" or "flatulent tumour," and thought it arose from "overstretching the sinewy parts;" and that it was "*air* which had the most to do in the matter;" although a little farther on the same author informs us, that "windgalls are soft yielding flatulent tumours or little bladders *full of corrupt jelly*."

THE APPELLATION OF 'WINDGALL' IS COMMONLY RESTRICTED to the bursal tumours upon the sides of the fetlock joint. Such restriction of its meaning, however, is neither warranted by authority nor supported by pathological investigation. SOLLEYSELL, who defines "the windgall" to be "a soft swelling, caused by a cold, phlegmatic, and serous humour," used the word in a *generic* sense; for, although in one place he tells us windgalls "are seated on either side of the fetlock joint," in another he informs us that they "sometimes grow upon both sides of the *hock*." And this is the proper sense in which windgall, in our opinion, ought to be understood: a *bog spavin* and a *thorough-pin* being, in a medical point of view, quite as true windgalls, as the tumours usually so called at the sides of the fetlock joints. Therefore, the observations we are about to make on windgalls we intend should be understood as meant

to apply to bursal tumours of every description, be their situation where or their nature what it may.

THE ORIGIN OF WINDGALL will be more likely to be satisfactorily elicited through an inquiry into the functions the bursæ in a state of health are intended to answer in the animal economy, and the mode in which these functions are carried out in the economy of the horse in particular, than by any other course we can pursue. The bursæ are contrivances of Nature to facilitate the sliding of tendons and muscles, and even of the skin, over bones or other tendons, ligaments or cartilages, or any projecting parts. By preventing too close approximation, and consequent friction, they not only protect the parts between which they are interposed against any irritation that friction might create, but by removing the slightest impediment to it, they facilitate movement, and thus become aids to locomotion. And although but passive aids, still may the bursæ be regarded as parts suffering abuse from any excess of action, whether such excess consist in intensity of force or of frequency. Such excess of locomotion as goes by the name of "work" or "sprain," we find to be very commonly succeeded by the appearance of windgall, either in the form of what is usually so called, or in that of *bog spavin*, *thorough-pin*, &c. So connected are the two, as cause and effect, that whenever a horse presents himself exhibiting windgalls, we at once pronounce him to have "done work," or to have been "sprained." And yet, by no means infrequently are brought before us young horses—horses that have never been broken or backed even—having bursal swellings, not so much in their fetlocks as in their hocks; bog spavins being anything but rare occurrences among them. And these have manifestly arisen in the absence either of work or of sprain.

IN THE YOUNG HORSE bursal swellings are frequently said to arise from "weakness." The interpretation of which appears to be, that the joints—with which the bursæ are so generally connected, and with which in some parts they make common cavities, are in many a growing animal really physically too "weak" even to support the weight of its body; and the consequence is, they *bulge*, *i. e.* the capsular ligament becomes distended and stretched, and ultimately has its cavity considerably enlarged in

consequence of such pouching ; or, as happens in some cases, in consequence of communications with the bursæ in its immediate vicinity. This is the case in *bog spavin* ; the form of windgall to which young horses are especially subject. To this may be added, as another link in the causation, the manifest disposition existing in the constitution of the young subject to augmentation of secretion as well as to effusion. His capillary system seems ever exuberant—ever ready on the slightest provocation to relieve itself of the plethora natural to it at this season of life, in the emission of either serous fluid or synovial secretion or coagulable lymph, dependent on the nature of the exciting cause, and the part on which it is operating. For instance, if there exist a general plethora of the system, or a disposition from laxness or “weakness” of the capillaries generally, to effusion or secretion, the legs and sheath, being the lowest or most dependent parts, will tumefy and become enlarged ; on the other hand, if the joints or bursal cavities receive weight or motion beyond their powers to withstand, or which becomes the source of any increased arterial or hypertrophic action in them, then will the synovial secretion become augmented, and bog spavin or some other form of windgall be the result. But

IN OLD OR WORKED HORSES WHAT CAUSES WINDGALL? If weakness of fibre in the young animal be a local cause of windgall, overstretch or strain, from intensity of force or repetition of motion beyond the powers of the parts, may occasion the same thing in the adult or perfectly formed animal. Work tells upon no parts more than it does upon the joints. We witness this in the trembling knees and knuckling-over hind fetlocks of aged horses, and horses that have performed a good deal of hard work, as well as in the shambling, shuffling, bone-setting gait they in consequence get into ; and we see what are generally received as unerring signs of it in the windgalls upon their fetlock joints, upon the fore less often than upon the hind legs, in consequence of the nature of the work they have been doing being more likely to have called the one rather than the other into excessive action.

But distended and enlarged bursæ exist in situations where there are no joints, where the bursæ can have no connection with any joints. On such, work operates in a different manner.



Continual forcible tension or strain upon any muscle or tendon has the effect, through the extraordinary pressure and motion conveyed to it, of producing excited action in the capillary system of the bursa or bursæ such muscle or tendon plays over, the ordinate result of which is a distended or hypertrophic condition of such bursal structures. Bursal swellings of this description now and then occur upon the arms and hands of men, and are very apt to happen with laundresses in particular, in consequence of the exertion they are obliged to put their arms and hands to in washing. We remember to have seen a washerwoman's arms and wrists literally beset with such tumours. We took the opportunity of making some inquiries of her concerning them. She disavowed feeling any pain, or indeed experiencing any inconvenience from their presence; neither would she admit that they in any manner or degree detracted from her physical strength of hand or arm. Two inferences appeared deducible from this human case. One was, that the windgalls—*ganglions* as they are called by surgeons—had their origin in hard work; the other, that numerous as they might be, and in the instance mentioned were, they were productive neither of pain nor inconvenience, nor even of diminished power. And when we come to apply these facts—for facts as respect windgalls *generally* they appear to be—to horses, we cannot but form opinions in our own minds somewhat at variance with the notions entertained by the horse public in general on this score.

IF WITH THE PREDISPOSITION OF THE YOUNG ARE COMBINED THE CAUSES which produce windgall in the old or worked horse, the joints and bursæ may naturally be expected to give way. Parts incompletely formed, but growing into the strength and stamina they are intended one day to possess, cannot bear even the usage which to adult limbs is but healthful exercise; and therefore it happens that four and five year old horses, prematurely taken to be ridden or driven hard, or to be over-worked in riding schools, exhibit bog spavins and thorough-pins so frequently, and now and then windgalls (commonly so called) as well. In fact, the young horse, and, in particular, such a one as is coarse and long limbed and large jointed, when taken into work may be said to be the especial subject of bursal or

articular swelling; and it is rare, when such swellings have once become developed, particularly bog spavins, for him to get rid of them. They remain as evidence of his having been "put to work too early," and are apt to operate on the public mind to the depreciation of his value.

THE CAUSES OF WINDGALLS, then, may be set down to be, in general, such as come under the denomination of "hard work." The stretch, the strain, the sudden shock, the continual squeezing, and rubbing, the bursæ of such joints as the fetlock and hock are subject to; the stretch and occasional laceration the fasciæ bracing and supporting the bursæ experience; the strains and contortions to which joints are so obnoxious—all these, to say nothing about incidental injuries, such as falls, blows, &c., must be reckoned as so many causes, direct or indirect, of windgall. At the same time it must be borne in mind that in particular forms of disease—to be hereafter specially considered—particular causes will be found operative. Other causes are mentioned. Hurtrel d'Arboval says, that continued exposure to cold and moisture, in marshy pastures, will produce windgalls; and he is strongly in favour of the old notion, that they are also caused by the steeply inclined pavements in stables upon which horses, for the sake of appearance, by dealers, more especially, are kept for hours together forcibly standing by having their heads racked up.

THE PATHOLOGY OF WINDGALL has already, from some observations we have had occasion to make, received considerable elucidation. In its first formation and simplest form, windgall consists in nothing more than distention of the bursa through an inordinate quantity of its natural secretion. The bursa itself retains its normal structure; nor is the augmented secretion anything more than the same straw-coloured synovial fluid found in the cavity in a state of health. That this inordinate secretion is due to *inflammation* of the bursa, as is usually asserted to be the case, is to us extremely doubtful. For our own parts, we should rather say that, generally speaking, inflammation, properly so called, has nothing to do with it. In our opinion, there is increased activity in the capillary system of the bursa—that sort of hypertrophic action which produces inordinate nutrition and secretion; under the influ-

ence of which, fluid is emitted faster than it is absorbed, and distention of the sac is followed by increased growth and enlargement of it. And we are further of opinion, that this *dropsical* state of bursa, as it may be called, is frequently dependent upon some increased action—not amounting to inflammation—set up in the joint to which the bursa is auxiliary, in consequence of some irritation which it (the joint) has, from some cause or another, been the seat of. Hence it happens that windgall, in its first formation, in young horses in particular, is usually accompanied by fulness of the joint to which the bursa is proximate, or with which it is connected. This we consider to be the case in young horses especially. In old and worked horses windgall, in another form, may be regarded as an idiopathic affection, *i.e.* as a disease—if disease it is to be called—independent of the joint to which it may be contiguous. Since, however, some of the large bursæ have, either from the time of birth, or as a consequence of work—occasioning rubbing and pressure upon them—communication with the cavities of the joints, any distention of the joint itself, from over-secretion of synovia, will of course produce distention and enlargement of the bursæ in communication with the joint; a case in which the pathology of windgall becomes identified with articular disease or derangement.

Once filled to distention, there is not much likelihood of absorption of the effused fluid taking place; though in young and unworked horses bursal swellings do now and then, in the course of growth, with repose, disappear. In adult and worked horses, however, windgalls, although they may diminish, rarely completely vanish. Once formed, they mostly, under continued work, become chronic;—for months, years perhaps, remain *in statu quo*. At length, slowly, gradually, the parietes of the bursa, from being simply stretched, become thickened in substance, as well as enlarged in caliber; and the increase of growth, to which such alterations are to be ascribed, may go on to render that which was originally no larger than a marble of the size of an egg, and in some instances even larger still. It is probable also that, while such changes are going on in the size and substance of the bursa, alterations in its contents will become manifest. The synovial fluid, by degrees, acquires



a turbid hue; instead of remaining a clear oily-looking fluid, it comes to exhibit a flocculent serous aspect. Flocculi of lymph may even appear in it, a layer of the same constituting the lining of the enlarged and now probably inflamed bursa. Indeed, in the course of time, by increase of this stringy deposit, the bursa, instead of being a sac containing a liquid, becomes the enclosure of solid matters, or of matters partly solid and partly liquid. The tumour now, instead of being soft and elastic, as it was before, grows solid and hard to the feel; evidently, indeed, has undergone an established change of structure in its parietes, having become thickened and solidified and hardened. And this is the state in which we commonly find windgalls of the fetlock joints in old and hard-worked horses; a state in which they remain for years; nay, out of which it is but in comparatively few instances that they ever emerge, to change for one of a still more obstinate character, and one that may prove annoying or painful in a manner we shall hereafter point out. Of such tumours, that which was originally but membranous tissue, with the addition of no more than a lining of coagulable lymph, is converted into a fibrous structure, and from this into *scirrhus*. Even here, however, conversion does not stop. The *scirrhus*, in time, changes its nature to cartilage: concentric layers of that substance are found lining the inside; and in the course of time the cartilage changes, perhaps, to bone. At least, such are the transformations which, in windgalls of the fetlocks of very long standing, under the protracted aggravation of work, are very apt to take place. Our departed friend, Mr. King, veterinary surgeon of Stanmore, in his lifetime, showed us a beautiful specimen of ossified windgall. The tumour, which consisted of disease of the bursa lodged between the perforans tendon and the fetlock joint, in many places exhibited osseous patches; and it interfered, from its situation, so much with action, that the animal, incapable of extending his fetlock, was compelled, in going, to tread solely upon the toe.

Notwithstanding these augmentations of substance and changes of structure the windgall, of the fetlock in particular, in many instances experiences, and notwithstanding the proportionate diminution that, in consequence of the depositions

taking place inwardly, the cavity of the tumour necessarily undergoes, yet does not this cavity ordinarily become filled up and obliterated, but continues, greatly reduced of course in dimension, to exist and to contain fluid. This fluid may be but the natural secretion altered in colour and consistence; on the other hand, when the tumours experience a repetition of injury from continued stress and strain upon them, coagula of blood may be found mingled with the secretion, exhibiting together that grumous character Gibson called "corrupt jelly." In windgalls that have become not only solid, but, from their long duration and chronic character, firm and hard to the feel, is sometimes found, according to Hurtrel d'Arboval, a white chalky matter (*semblable à du plâtre*); though, according to him, this only occurs in cases in which the joints and tendons have become stiff.

Our esteemed coadjutor, Leblanc, who has made these morbid changes his study, says, in giving an account of them, that he has observed the synovial membranes to lose their transparency and become variously clouded; in the same articulation some portions of the membrane being of a vermilion red, while others exhibited a cherry red, a deep red, a yellow, and now and then a black aspect—such changes being particularly observable about the synovial fringes in the joint. Frequently, gelatiform infiltrations are observed underneath the membrane, within the fringes and the cellular tissue by which they are surrounded; veritable false membranes of greater or less extent are likewise to be seen within the articular capsules. These membranes, adherent sometimes in places, at other times quite free, present great diversity of tinge and consistence: frequently they exhibit an analogy to the fibrine of agitated blood; at another time they preserve the aspect of highly smooth, white, hard, and lenticular bodies, floating at large in synovial secretion. In inveterate windgalls which are fully developed, and whose parietes, formed into a multitude of little caverns as it were, have become cartilaginous or even osseous, the synovial membrane and articular cartilages are destroyed, and the surfaces of the bones worn as if from radiated motions. Such wear of the cartilages and bones is likewise to be observed in old horses in whom there is even no suspicion of joint

disease. The synovial fluid is also altered : ordinarily, it is thinner and of a deeper hue than in its normal state.

WINDGALL IS RARELY PRODUCTIVE OF LAMENESS ; so rarely, indeed, that horse persons in general look upon such swellings, frequent as they are in horses of all ages and all kinds, with that sort of complacence which denotes all absence of apprehension in their minds on account of such blemishes. The washerwoman's arms yield strong evidence in favour of this view of the harmlessness of windgalls, and pathological investigation into their history and nature fully bears out the same views. The bursæ are parts in their normal state insensible. "The bursæ, when unavoidably cut in operations," says Dr. Munro, "have appeared to be insensible, and I have observed them swell without considerable pain. But sometimes, as in rheumatism, they swell with great pain."\* Now, in horses we know they commonly "swell without pain" or lameness ; and this happens from the circumstance, we believe, of inflammation not being an accompaniment of such swelling or distention. In the young and growing horse, the joints, and bursæ along with them, become "dropsical" (as we may call it) from "weakness," after such manner as has already been explained ; in the adult and worked horse, they become so from an action augmented or hypertrophic, but not to be called inflammatory ; and in neither case, in the absence of inflammation, is pain or lameness a consequence. Years roll over such horses' heads, and their windgalls remain *in statu quo* ; save and except such changes as may be tardily going on in them, which, being brought about without inflammation, are still, most likely, unproductive of lameness.

This immunity of windgall from pain or lameness, however, has its limits. We know there are states and times when the old and worked horse suffers from his windgalls ; and we likewise know that there are species of windgalls, connected more particularly with the synovial sheaths of tendons, in which lameness is a prominent symptom even from their very commencement. To these respective cases we shall have occasion to advert when we come to treat of *particular* windgalls.

THE SITE OF WINDGALL will, of course, be confined to such localities as are furnished with bursæ mucosæ or synovial sheaths :

\* Op. cit. at page 273.

these however in the limbs, in the vicinity of the various joints in particular, are so numerous that divers are the situations in which windgalls present themselves. In some situations they are so common as to be, in horses in work, oftener present than absent; while in others their presence is so rare that but few or no examples may happen to occur to a practitioner in the course even of his lifetime. The ordinary seat of windgall, everybody, in or out of the profession, knows is the fetlock joint: in fact, so common is this site, that, when "windgall" is spoken of, this is the description at once taken for granted to be referred to. The next most frequent site—perhaps, in young horses, a more usual one—for windgall, is the hock-joint. *Bog-spavin, thorough-pin, and capped hock*, may be regarded as so many species of windgalls occupying different localities about the hock, and differing in their nature and importance according to their several respective localities and connexions. Next in priority comes the elbow; then the knee. Last of all, the front of the fetlock, and in the heel.

**SPECIES.**—One windgall differs from another in character and consequences, not only as regards the part or tissue each respectively occupies, but in the relations which from its particular locality each respectively has with surrounding parts and tissues. Some windgalls, from their relation to joints, either from their first formation make but common cavities with such joints, or in the course of time do so afterwards; others there are which maintain themselves free from all such communication, notwithstanding they are in the vicinity of articulations. Others, again, there are which from their situation are altogether independent of the joints.

Another marked distinction between windgalls is self-evident in the circumstance of some being accompanied by lameness, while others there are—and these latter, as we have already stated, constitute a vast majority—which are hardly ever known to be productive of lameness: at least so long as they continue to remain in that *statu quo* they ordinarily present themselves.

**THE TREATMENT OF WINDGALLS**, unless lameness arise from their presence, is a matter little heeded by professional persons; nor is it one sought after much by persons out of the profession, unless at such times as horses are growing "stale upon their



legs," and then the presence of windgall is frequently made a pretext or necessity for blistering or firing. The windgalls, being the only abnormalities discoverable by such persons, are naturally enough regarded as the causes of the "staleness," and as naturally are desired to be removed. It has been shown, however, both as the result of experience and pathological investigation, that windgalls, of a kind that do not produce lameness, or inconvenience by their magnitude, or offend the sight by their situation or their size, in point of fact require no treatment: to which another reason may be added for letting them alone, and that is, that in general, particularly when they are chronic, they prove exceedingly stubborn and intractable under treatment of every kind. If windgalls are to be treated at all, the earlier after their formation remedies are employed the better the chance of their reduction or removal; hence it is that in young horses such tumefactions\* are frequently entirely got rid of, not more, perhaps, by treatment than by attention to any circumstances or agents to which they may appear to owe their production. Taking such animals off any work that may appear to be too much for their limbs to sustain; remedying any injurious or mal-position into which their fetlock joints may have been thrown either by shoeing or the improper slant given to the standing of their stalls; preventing kicking in the stall, pawing, &c., is all that is frequently required for the cure of such cases as capped hock, capped elbow, tumefied knee, &c.; these or other causes, if there be any, being removed, we may look forward in young subjects, and in adults sometimes, so long as their windgalls are not become chronic, to more or less spontaneous subsidence of them. Indeed, it frequently happens that, as young animals grow and alter, so their windgalls in part or altogether disappear: whereas in aged horses—in subjects in whom they have "grown with their growth and strengthened with their strength"—it is a forlorn hope to set about attempting to get rid of them; for even should any trifling reduction in their volume be effected by medicinal means, there remains great probability of their returning to their former size whenever the animal is put again to the same hard work to which the tumours owed their production.

\* Bog-spavins excepted.

Nevertheless, if lameness be an accompaniment of the bursal swelling, or if the tumour be such as either from its volume or situation incommodes the animal in any way, or offends his master's eye, treatment must be adopted ; and we know of no better, when the case is recent, than such as is a combination of the antiphlogistic and the stimulant. We have repeatedly found, for the reduction of recent bursal tumefaction, a good blood-letting, as topical as it can be made, combined with the operation of a brisk cathartic upon the body, and that of a blister upon the windgall itself, most effective in reducing the enlargement. We are not friendly to fomentations, the best of which in such a case would be the spongio-piline (of which by-the-bye, we have not yet had sufficient trial to enable us to offer any opinion about in respect to windgall) ; neither have we experienced the same happy results from refrigerant lotions and bandaging as we have from vesicatories. And as soon as the influence of the blister has subsided, it is an excellent practice to renew the excitement by daily well rubbing into the surface of the tumour some ointment or embrocation known to possess the power of bringing the absorbents into action. Hurtrel d'Arboval speaks in high terms of commendation of a mixture of the volatile oil of lavender and oil of turpentine in equal parts. From twenty-five to thirty drops of this mixture he directs to be well rubbed in for nearly half an hour ; the horse afterwards to be walked out until the irritating effects of the application subside : the same to be repeated again in the course of the day, the part being kept covered up during the interval by a woollen bandage firmly pressed upon it.

The best remedies we know of are the iodine and strong mercurial ointments, some practitioners preferring, to their separate use, availing themselves by mixture of the combined action of the two. Whatever ointment or liniment—for one or other is the usual and best form of application—be used for windgall, it must be borne in mind that *friction* has a good deal to do with its efficacy : without being well “rubbed in,” little good can be expected. Indeed, it is an excellent practice to rub the part for some time before applying the ointment ; the inunction being doubly effectual upon a surface thus warmed, and whose pores, through friction, have become cleansed of any obstruction, and

so rendered more bibulous. And in situations where it can be conveniently applied, *pressure* likewise, by bandage or otherwise, will be found an important agent in promoting absorbent action. An ointment which has been strongly recommended to us for the dispersion of bursal swellings that are becoming chronic, is composed of the bichloride of mercury and simple ointment or hog's lard, in the ratio of ʒi to ʒi. In using an application of this kind, however, the same as in the case of an ordinary blister, we must bargain for the loss of hair from the parts. But such a vesicatory may be used as, with caution, to guard against this consequence. The *acetum cantharidum*, compounded and applied in the manner prescribed at page 180, will not disturb the hair.

Should such measures as we have recommended fail in accomplishing our object, the question might be raised of how far it would be desirable or politic to employ cauterization: and, to carry this into effect, either the windgalled parts may be fired in the usual mode, or the hot iron may be applied over the surface of them, with a piece of hog's skin interposed, so as to imitate pretty closely what surgeons call the *moxa*. It rarely happens, however, that we are called on to use the actual cautery for windgall alone: generally speaking, the windgalled legs are, at the same time, from other causes, *failing* legs; very often there are present the accompaniments of thickened and rounded sinews, for which causes is the firing especially required: the windgalls being probably more secondary than primary in the causation of the failure.

A summary mode—and, were it not for the danger that too frequently attends it, the most effectual one for the removal of windgall—is an operation having for its object the discharging of its contents through an external opening, and the subsequent destruction of the secretory powers of the membranous sac composing it. And in such a case as capped hock, or capped elbow, or any insulated bursal swelling, unconnected with any joint or synovial sheath, such an operation has been followed by the happiest results. Not only has the enlargement been in a comparatively short time got rid of, but the fruitful producer of the fluid has been, at the same time, utterly destroyed. On the other hand, it is our duty to state, that sometimes, instead of

pleasing results like these, have supervened on the operation frightful and alarming consequences. Inflammation has seized the open sac of the windgall ; the part, and with it the limb, has become enormously swollen ; the system has sympathised, and fallen into a state of irritative fever ; life itself even has been threatened through what has appeared so simple an affair of operation. Occasional results such as these have, in a great measure, deterred us from pursuing this practice. Some French veterinarians appear to have been more venturesome ; but whether or not on account of being more successful in such undertakings, we shall make it our business hereafter to inquire.

Certainly, no operation of the kind ought to be undertaken so long as any inflammation is perceptible in the part ; neither, on the other hand, would a case which had become chronic, wherein a great deal of thickening and alteration of the capsule of the windgall is discoverable, be a fit one for operation. The capsule, indeed, should be but slightly or hardly at all altered, and be entirely free from inflammation, while it is filled to distention with redundant fluid ; and then, we should say, taking it for granted that nothing in the general health or condition of the animal forbids it, that such was a case for the operation, providing we felt confident enough of success to engage in its performance.

Of the two modes which have been proposed and practised for opening the sac, *incision* and *puncture*, the latter is generally preferred. The formidable wound, and consequent exposure of the cavity of the bursa, incision inflicts, now and then excites awful inflammation in the part, as well as tumefaction of the whole limb, and alarms us for the result ; while the only advantage over puncture incision holds out is the impossibility of any fresh collection of fluid so long as the wound be kept open.

PUNCTURATION, whenever operation is determined on, is for many reasons safer than incision ; and either a very small trocar or an acupuncture needle is the best instrument we can use for the purpose. In regard to the site of puncture, we have, for our own part, generally chosen the inferior side or most dependent part of the tumour. This, however, we are told by Hurtrel d'Arboval, is wrong. He prefers the *superior* part of the tumour : assigning as his reason, that the fluid ought to be



forced out by pressure rather than be suffered to run out of itself, and that, as soon as it be all pressed out, great care ought to be taken to close the wound, and to keep applied for some days a compress and bandage upon it, with the addition, if we like, of some discutient lotion. He objects to the aperture being made beneath, because the fluid would then run away by itself and prevent any healing, and so might cause it to become fistulous.

A SETON, passed from an aperture above through to one below, or from side to side, would certainly have the effect of giving vent to the discharge as it became secreted ; but, exposing to the air and creating suppurative action in such a joint-like cavity as a bursa, we regard as highly objectionable and dangerous practice : we have known the worst of consequences ensue from it, and we have, on that account, for some considerable time past, abandoned all thoughts of setoning synovial structures.

Should it happen, after the discharge of the fluid, that the wound made by the instrument heals forthwith, fresh secretion will be certain to be poured out, and the sac to become refilled. More commonly, however, it happens that the secreted fluid continues, in part, to find escape for a few days through the puncture, in the course of which time inflammation sets in and closes up the opening : the only danger being now that of greater inflammatory action and swelling following than is agreeable either to our patient or to ourselves. Antiphlogistic treatment, constitutional as well as topical, will, of course, in such a case be called for to a given extent ; the object being, not to drive away the inflammatory action, but to keep it within such limits as shall conduce to the end we have in view ; viz. the effusion of lymph into the sac, instead of pus, and through that of the adhesion of its sides and ultimate obliteration of its cavity. On the other hand, should it so happen that the inflammation is insufficient for the object we have in view, we have it in our power to augment it in the part either by some external application or by some stimulant or escharotic injection. All this, however, as well as the other points of treatment, will have to be more defined and detailed when we come to treat of individual windgalls.

According to the vulgar acceptance of the term "*windgall*," as we have before had occasion to remark, the tumours we now are about to describe are those indicated, although in a pathological point of view others of a similar nature appear quite as much entitled to the appellation. In speaking of "*windgalls*," it would therefore render our meaning more definite would we qualify the generic name by such additions as *windgalls of*, or *in*, or *about*, *the fetlock*, *pastern*, *knee*, &c.

THE WINDGALL OF THE FETLOCK constitutes one of the most ordinary forms in which we meet with the disease; and the every-day aspect of it, combined with the innocuousness of it in a general way, furnishes us with the reason of its being a disease concerning which we are less consulted than about almost any other. Bog spavins and thorough-pins create occasional uneasiness in the minds of possessors of horses, while windgalls of the fetlocks are, as it were, altogether overlooked; or rather, perhaps, are regarded as nothing beyond what happens in "the regular course of nature." The only occasions on which windgalls seem to trouble the minds of horse-folk are, as we formerly observed, when failure in the fore limbs comes to be noticed—"stiffness," "staleness," or "groginess," and then windgalls, if present—which they pretty invariably are—are apt to come in for a great deal more than their share of the causation of the recorded failure.

LAMENESS RARELY RESULTS FROM WINDGALLS, however; neither are they, under ordinary circumstances, to be regarded as sources even of weakness or inconvenience: in fine, common windgalls no way injure the limb nor detract from the sterling value of the animal. They most assuredly are, in horses of a certain age, or that have performed any great deal of labour, to be viewed as "signs of work:" at the same time, in the usual condition of such swellings, the limbs appear to act as freely and as firmly with as without them, and horses that have them in all their legs continue working for years without manifesting any complaint or indication of failure whatsoever.

Connected, in one instance, as windgalls are with joints, in another with tendons, in another again with ligaments, use and sprain and contortion of such parts must, of course, more or less affect them: indeed, under such circumstances it is that

they oftentimes take their rise, and at all times become aggravated and augmented. And cases of this description do occur in which inflammation arising in contiguous parts extends to the bursa, and implicates the windgalls in the causation of the pain and the lameness, in consequence of its rendering them sensitive and tender on pressure or motion. In sprains of the fetlock joint, and of the back sinews and suspensory ligament, this, we know, not infrequently takes place.

Under such circumstances as we have just described, or from repeated hard work, windgalls, originally attracting no particular attention from their magnitude, will frequently acquire very large volume, and other parts of similar structure in their immediate vicinity will take on the same morbid action. Thus, windgalls about the fetlock now and then, in horses hard-worked or strained, extend high up the back of the leg, in consequence of the sheath of the flexor tendons participating in the same dropsical action. Whether any rupture of the original windgall happens, and so communication be established between it and the new-formed tumour, is a question in our mind still unsettled for want of a fitting subject for dissection. It is notorious enough, that there is a great deal of variation in the bulk of such large swellings, as there is, indeed, to some extent, in certain ordinary forms of windgalls, they being larger after work than at other times; hence it is we hear a person say, his horse's windgalls after work "run up to the hock:" owing, we repeat, to the implication of the vagina of the tendons. Now, in cases of this kind, it is very possible, tenderness and stiffness, or even lameness, perhaps may be observed, and be referrible to the enlarged and distended windgalls: there will be evinced a flinching and catching-up of the limb when the tumours are handled, and an uneasiness in standing manifested the day after the work by resting first one leg and then the other. Aged horses that have in their day worked hard are very apt to evince this sort of renewed irritation in their chronic and morbidly altered windgalls. Old coachers and posters afford evidence enough of this. But give them, however, a day or two's repose, and all comes right again.

WINDGALLS OCCUR IN THE HIND FETLOCKS a great deal more frequently than in the fore, and likewise, in general, run to

greater size in the former, and are more inclined to be troublesome, and so to call, whenever they do call, for remedial measures. They are likewise oftener seen in clean-limbed horses, and such as show breeding, than in those of an opposite character. In all this we trace the consequences of exertion. We know how much more the hind limbs have to do in progression than the fore ones; and we also know how much quicker and sudden, and more trying and straining, are the movements of blood horses—of racers and hunters and well-bred harness horses—than those of half or coarse bred or cart horses.

THE SEAT OF THE FETLOCK WINDGALL is so well known that any description of it might appear not supererogatory merely, but ridiculous. And yet it may not have occurred to the superficial observer that the nature of windgall, which to him appears like one general or uniform swelling, is in reality *double*. Sometimes, it is true, there is but one place in which any tumour is found, and that is immediately above and behind the fetlock-joint, either on one side or, as is usual, on both. The double tumefaction is produced by the presence of a bursal tumour higher and still more backward, and commonly of less volume, than the former. And this, as well as the lower one, is apt to be more prominent upon the outer side of the leg than upon the inner; so much indeed, in some cases, that it actually curls round the back of the leg. The tumours have the ordinary puffy feel, and look, in shape and bulk at least, like pigeons' or birds' eggs inserted underneath the skin. Dissection unfolds to us that the superior windgall is lodged in the interval between the perforatus and perforans tendons, about two inches above the sesamoid bones: indeed, the sac of the windgall, from surrounding attachments to its borders, appears as though it gave passage to the perforans tendon through its cavity; though this appearance, in point of fact, is owing to the membrane or the bursa being reflected upon the surface of the tendon. The inferior and anterior windgall is situated half an inch lower down. It is seated in front of the perforans tendon, between it and the suspensory ligament, occupying the interval there existing between the bifurcations of the ligament just named. The connection of these windgalls with the flexor tendons

and suspensory ligaments of the limbs accounts for the opposite conditions in which they are found, tense or flaccid, according as the sinews are braced or unbraced. While the foot remains upon the ground and the muscles continue in action, the windgalls are full and firm to the feel; the moment, however, the foot is raised, and a state of inaction succeeds, they become soft and compressible.

FETLOCK WINDGALLS UNDERGO MORBID CHANGES, however, the same as windgalls of other parts do: indeed, from the amount of irritation and aggravation they receive, they may be said to be more obnoxious to such changes. In the course of time, under the influence of work, they grow thicker and thicker in their sacs; additional coatings are deposited upon them, to strengthen them, as it were; and these depositions, from being cellular, in time become fibrous, callous, and even, as we have already seen in the case mentioned of Mr. King's, converted into bone; occasioning at first stiffness, then lameness, and ending in partial or complete immobility of joint. These changes, as they are brought about, account for the less and less puffiness and fluctuating character the swellings acquire by age; as well as for the solid, even hard, feel they possess in their chronic state in the aged and used-up horse.

IT IS RARE FOR WINDGALLS TO REQUIRE TREATMENT; abstractedly, at least, from concomitant failings. Manifest disease or derangement exists in the fetlock joints—we say “joints,” because they almost uniformly fail in pairs—and then, coupled with the presence of prominent windgalls, ample cause is usually discovered for either blistering or firing the affected joints, inclusive of the windgalls. Not that we shall thereby altogether get entirely rid of the windgalls; but that we shall succeed by such remedies, combined with ample repose, in reducing the swellings, and in restoring soundness, and bracing and strengthening the relaxed and knuckling-over joints as well. It is not often that we are called to treat windgalls, and less frequent still is it that we feel ourselves justified in such undertakings; and when we do set about to treat them, it is but with doubtful result, so far as their reduction is concerned, unless we employ remedies—such as strong irritants and blisters—that lay the horse up, and this is what is seldom



permitted. Therefore, if required to do something towards lessening their volume while horses are still going on with their work, the best treatment for windgalls is some well-regulated course of pressure or friction, aided by discutient applications. A russia-duck bandage, three yards in length, and four inches in breadth, will, by being neatly and tightly rolled round the leg in such manner as to give the windgalls the principal pressure, wetted with simple water even, and better still if with some lotion possessing stimulant or discutient properties, in time bring about some good, particularly when there is any reason to suspect inflammatory action in or about the tumour; though better treatment than this, in general, is well rubbing into the tumours iodine ointment of adequate strength, or else an application composed of equal parts of the iodine and strong mercurial ointments. The sublimate ointment we mentioned before—consisting of ʒj of finely powdered bichloride of mercury rubbed with ʒj of hogs' lard—has likewise been highly commended as a remedy of this sort for windgalls. As has been, however, more than once repeated, windgalls of the fetlocks, in point of fact, of themselves, under ordinary circumstances call for no treatment. So long as they are recent, repose alone will create in them a disposition to subside. And when something more than common happens, seeming to require our assistance, we must in our examination of the windgalls take care to inquire into any ailment or alteration with which they appear to have any direct or indirect connection.

#### BOG SPAVIN.

THIS is a misnomer for the disease we are about to consider. Contrary to what might be expected, it has no relation whatever to SPAVIN, properly so called; but has acquired the same appellation, as it would appear, simply from the circumstance of its being a swelling occupying pretty nearly the same situation: the epithet "bog," meaning something that *bends* or *yields*, being prefixed as the antithesis of *bone* spavin, which is a tumour hard and unyielding.

A BOG SPAVIN MAY BE DEFINED to be, a soft, elastic, fluc-

tuating, tumour, of the nature of windgall, growing upon the inner and anterior part of the hock joint.

THE MAGNITUDE AND FORM OF THE TUMOUR are, ordinarily, that of the section of an orange, small or large, and prominent, according to circumstances.

THE SITE OF THE TUMOUR is the anterior and inner part of the hock joint, in the interval between the malleolar projections of the tibia, above and more anteriorly than the situation of (bone) spavin.

THE DIFFERENCES BETWEEN BOG AND BONE SPAVINS are, therefore, obvious. Their sites are not the same. Their consistencies are different; one being soft, the other hard. And the tumour of bog spavin is broad and extended, while that of bone spavin is comparatively small, and is circumscribed. Other differences of a more important character there are, pathological and consequential, which will become developed as we proceed.

THE CAUSES OF BOG SPAVIN are such as produce windgall in general; to which may be added such as in a peculiar manner or degree operate upon the hock. They may be regarded as divisible into *general* and *local*. Febrile, rheumatic, and general dropsical or œdematous affections, will be likely to be attended with augmented secretion of synovia in the joints of the body in general, and in an especial manner of the hock. But the hock being the joint upon which so much depends in progression, any excessive work the animal may be made to perform, or excessive weight he may be forced to carry, will in a peculiar degree tend to stretch, strain, or disorder this joint; so that, while the fetlock joints are the parts upon which work or concussion tell in the fore limb, the hock joints are the suffering parts, under like circumstances, in the hind limbs. Considerations of the structure of the hock joint, of its situation in the animal frame, of its motions and functions, will satisfactorily account for its susceptibility to derangement and disease, as compared with other joints of the hind limb; and we shall pretty invariably find that its disorders are prevalent and intense, according as the animal has been over-worked or over-weighted at a tender age, or excessively worked or anywise abused in work at an adult or advanced period of life.

Intensity of motion, or any undue stress upon the joint of the hock, tends to create irritation, if not inflammation, in a part so delicate by nature as its lining membrane, the consequence of which is augmented secretion of synovia, producing what we call "bog spavin." Young horses with large joints put to do work or carry weight beyond their strength; heavy-worked harness horses, hunters, steeplechase horses, racers, and so forth, are on these accounts the especial subjects of bog spavin. And those equestrian movements that throw most stress upon the hocks, such as pulling horses upon their haunches, backing them, suddenly or violently checking or pulling them up, heavy draft, &c., will operate in a peculiar manner in the production of the disease.

BETWEEN THE PATHOLOGY OF BOG SPAVIN AND WINDGALL there is this important difference—that, while windgall has a bursa for its seat, bog spavin consists in enlargement and sacular dilatation of the capsule of the joint itself, viz. the joint of the hock. It will be remembered that the hock is composed of several joints or articulations; but that the principal of these is the one between the tibia and astragalus, which, in consequence of its being that through which the motion requisite for progression is mainly carried on, commonly goes by the appellation of *the* hock joint; and this joint it is which is the seat of bog spavin. Inordinate stress or motion of this joint, as has been already observed, has a tendency to produce irritation of its delicate lining membrane; and this, once set up, is productive of augmented synovial secretion in it: the effect of which is, first, distension, and subsequently dilatation, of the capsule of the joint. In place of from three drachms to half an ounce of synovia, which is the quantity usually found in the joint, in this anormal condition of it from two to three ounces, and even more, will frequently be found to be collected: in fact, the joint may truly be declared to be in a *dropsical state*. Under such increased pressure the capsule of the joint gives way; and those parts of it which are weakest from want of support externally give way the soonest, or in other words *bulge*, and form tumours visible through the skin. The part of the capsule most likely to bulge, not only from its being a part unbraced by ligament or tendon, but likewise from its



being a dependent part, and one against which the accumulated fluid is thrust by the mere weight of the animal, is the inner and anterior part of the hock joint; the site, in fact, of bog spavin.

The saccular dilatation of bog spavin once produced, there is no chance of the return of the capsule to its original contracted state; on the contrary, Nature sets about making additions to it in order to guard against the consequences of its dilatation. Attenuated as the capsule has become through its extension, and immediately underneath the skin as its dilated sac now is, there seems danger, not only of this giving way, but of the common integuments even doing so; and therefore is a process of thickening and strengthening set up in the parietes of the sac, by which, in the course of time, they grow from less than an eighth to more than a quarter of an inch in thickness; nay—as we have witnessed them—to three-quarters of an inch in density.

In the generality of cases this may be said to be the termination of bog spavin, little else than accumulation of synovia and thickening of the dilated sac appearing to take place. This accounts for lameness being unheard of in bog spavin in its ordinary form. Cases, however, occur in which disease proceeds further—or rather commences; for, so long as ordinary bog spavin continues in *statu quo*, it can hardly be accounted disease—renewing its attack on the joint, as well as in regard to its secretion as to its lining membrane. Mr. Pritchard (in his excellent remarks on the subject in *THE VETERINARIAN* for January, 1849) informs us he has discovered alterations to have taken place in the synovial fluid secreted under such circumstances, as well in thorough-pin as bog spavin. “The fluid,” he says, “becomes highly charged (first) with cartilage, then with calcareous matter; and the whole tumour of the hock becomes converted into ossific substance, of which I have a very large and excellent specimen. The first change in the synovia is in the increase of its albumen. Then cartilage appears, most commonly in the form of cotton threads from one to two inches in length, perfectly white, resembling fine needle-like worms, floating in the thick deep-coloured synovia. These threads increase in number and size; then comes the calcareous matter, by which perfect ossification is effected in regular

spherical masses ; and in one case, of which I made a particular note, I was surprised at the early period of the disease at which these threads of cartilage appeared, and in considerable numbers."

In respect to the lining membrane of the joint, we have observed its smooth glistening surface to lose its transparency—to become, first opaque, then deadly yellow in aspect, and, finally, to present a surface uneven, rugged even, in consequence of being studded with exudations of coagulable lymph in a state more or less advanced towards assimilation to the altered condition of the membrane itself. Sometimes, in a more advanced stage of disease still, the membrane exhibits a sort of fibrous or reticular character, having running over its surface slender bands or cords of considerable toughness, disposed after a manner to form so many little meshes or pouches upon the membrane. Within the cavity of one bog-spavined joint we examined, lodged in the upper and posterior compartment of it, we found a small parti-coloured ovoid body, in appearance not unlike the pineal gland of the brain, though not above half its magnitude, secured in its situation by slender cords of the same description as those first mentioned. The substance being cut in half, nought was found within it but some loose soft tissue resembling a mass of condensed cellular membrane.

In some comparatively rare instances the thickened capsule of the joint, after the continuance of bog spavin for some length of time, becomes slowly converted into a solid and hard substance of the nature of *callus* or cartilage, and this, in the progress of the morbid action, changes into osseous substance ; transformations which, as we have seen, Mr. Pritchard regards as taking place in the secreted fluid of the joint. This ossific action may, however, not confine itself to the region of bog spavin, but may extend over contiguous parts, and at last grow into a large spreading ugly tumour upon the inner side of the hock joint.

BOG SPAVIN IS NOT PRODUCTIVE OF LAMENESS so long as it maintains its ordinary form, or, in other words, so long as it consists merely in accumulated secretion and thickened capsule. Nor, in general, is there any reason to apprehend any thing

further. Still, every now and then do we meet with cases in which bog spavin is growing into or has already become a formidable disease. Inflammatory action appears to be set up in the capsule of joint; and those changes in the lining of the capsule, and in its secretion, which have been already detailed, supervening, the disease presents itself to us in the form of a tumour upon the inner side of the hock, spherical in its form, and of considerable magnitude, conveying heat to the feel and tenderness to pressure, which, from its producing lameness, and perhaps to a serious amount, peremptorily calls upon us for

TREATMENT. Of what kind, however, will depend upon the state in which the hock is brought to us.

Supposing that there is evidence of inflammation existing in it, even though that be of but an incipient or declining character, blood-letting, in as topical a form as practicable, had better, without loss of time, be had recourse to. We seldom do much good by opening any vessels about the hock for this purpose, and, therefore, our best practice is either to let blood from the femoral vein, or from the artery circumflexing the toe of the foot. In general, the former is adopted. A dose of cathartic medicine may aid our object. And continual fomentation—with the *spongio-piline* in particular—will do a great deal of good. As soon as inflammation has departed, either a blister or the firing-iron may be brought to bear. In general, the blister will be sufficient. Any tumour, and consequent stiffness of motion in the joint, that may remain after the blister, will be relieved, if not removed, by iodine ointment well rubbed into the enlargement daily; in combination or not with mercurial ointment, according to the judgment or caprice of the practitioner.

#### BLOOD SPAVIN.

IN Hunter's "Complete Dictionary of Farriery and Horsemanship,"—"compiled from the best authors"—blood spavin is described to be "an enlargement of the vein which runs withinside a horse's hough, forming a little soft swelling in the hollow part, which is pliant to the touch, and is frequently productive of weakness or lameness of the part. When this disorder is in its infancy, it will frequently give way to the use

of spirituous and saturnine applications," &c. But "if, after following this mode of treatment for a sufficient length of time to insure success, &c., there should appear little or no amendment, the (following) blistering application had better be tried."

After such a declaration as this, on the authority of the "best authors" were we to refuse to entertain the subject of "blood spavin," we might justly be said to lay ourselves open to animadversion for offering no opinion on what was regarded and treated as a *disease* by our ancestors in the practice of "farriery." We feel we have no right to treat either them or the public with such "contemptuous silence;" but, on the contrary, are called upon to divulge what the result of our own experience has taught us concerning the asserted "enlargement of the vein," which is said to be "frequently productive of weakness or lameness in the part."

A common accompaniment of bog spavin—nay, almost a constant accompaniment whenever the tumour is full and prominent—is distension of the *vena saphena*, or main superficial vein of the hind limb, at the place where it meets with the bog spavin, over which it passes in its course to the thigh. That pressure made against the vein by the tumour should produce some impediment to the flow of blood through it, and so cause the vessel to become full or distended at this particular part, is no more than one might expect, and what, in fact, does happen. But to say that the vein in consequence becoming "enlarged," or, in surgical language, becomes *varicose* from this pressure, is more, we must confess, than we have been able to convince ourselves takes place. We believe the fulness caused by the pressure against the vein to amount at greatest to no more than distension of the vessel; we have never had reason to suppose that any actual dilatation or "enlargement" existed; and therefore, for our own part, we must be content to dismiss the subject with the remark, that it would appear as though the bulging of the capsule of the hock-joint had been confounded with the distension of the vein, or, in other words, that the tumour was thought to arise from the latter; and that this supposition would the more readily be entertained from the circumstance of blood, and not joint-oil, being found to issue whenever puncture was made at the place where naturally it

would be made, to let out the contents of the swelling, viz. the most prominent or *pointing* part of the "enlargement."

#### THOROUGH-PIN.

A THOROUGH-PIN MAY BE DEFINED TO BE, a windgall *running* from side to side *through* the upper and back part of the hock.

THE NAME OF "THOROUGH-PIN" owes its derivation to this "running through" or *thorough*; it being originally taken from the French *vessignon chevillé*, which means precisely the same thing as our *through* or *thorough-pin*.

THE SITE OF THOROUGH-PIN is notorious enough. It occupies the floor of the hollow interval at the supero-posterior part of the hock, between the joint in front and the tendo Achillis behind; reposing, as it were, after the manner of a cushion placed transversely upon the joint beneath.

FELT on either side, it has all the sensible characters of windgall; and the fluid it contains is readily made, by pressure or pulsation with the fingers, to fluctuate from one tumour to the other, showing that free communications exists between them. In fact, to external examination the swellings appear as though an oblong bladder or windgall had become formed here, and that it was compressed or nipped together in the middle by some narrow pass it had to permeate.

This is the ordinary but not invariable seat of thorough-pin; for, on occasions, the tumours exhibit a more spread-out aspect, and are broad or even diffuse instead of being spheroid or ovoid and circumscribed, and so extend downward upon the sides of the hock; though this latter is a remark more applicable to the tumefaction upon the outer side.

THE TUMOUR IS NOT NECESSARILY THOROUGH, or *chevillé*. Sometimes it is confined to one side; and more frequently, we believe, in this single form, will the swelling be found outward than inward. Such cannot, strictly speaking, be called *thorough-pin*, although in nature the tumour nothing differs from it. When true thorough-pin is present, however, the inner tumour is generally the larger or the more prominent of the two.

TRUE THOROUGH-PIN IS RARELY OR NEVER SEEN WITHOUT BOG SPAVIN, although bog spavin, in the majority of instances,



is unattended by thorough-pin. The pathology of thorough-pin will explain this seeming paradox.

THE CAUSES OF THOROUGH-PIN, so far as they are immediately *exciting*, may be said to be the same as produce bog spavin. A hock that is over-weighted or over-worked, over-stretched or strained in any way beyond its powers, will be likely to put out a bog spavin, and afterwards may show thorough-pin. And, as was observed on another occasion, this may be expected to happen to young horses in particular at the time of breaking, and especially to such as have great frames with large bony joints.

IN RESPECT TO PREDISPOSITION, straight hocks are more liable to bog spavin and to thorough-pin than those of an opposite formation. On this account, young horses with such predispositions should have attention paid to the shoeing of the hind feet. Since caulking may be likely, by raising the heels and so still further straightening the hocks, to add to this susceptibility, it will generally be found advisable to have such horses' hind shoes made plain in the heels. Solleysel, who treats of these affections under the general heading of "wind-galls," says, that "this disease (seated between the great sinew of the hock and the thigh bone) is often *hereditary*, and derived from the stallion." And, so far as conformation of hock goes towards predisposition to the disorder, we quite agree with Solleysel.

THE PATHOLOGY OF THOROUGH-PIN is analogous to that of bog spavin. It consists in anormal accumulation of synovia in the joint of the hock, and consequent dilatation and bulging of the capsular ligament. The cavity of the hock joint may be said to be naturally divided into two compartments by the trochleated adaptation of the tibia to the astragalus. So long as the joint is at rest and the animal is bearing his weight upon it, all communication between these two compartments of the joint is shut off; while, on the other hand, the joint is in motion, and especially so long as the hock is flexed, and all bearing is taken off it, it is possible for fluid to pass from one compartment into the other. Moreover, at the places where thorough-pin makes its appearance, viz., between the lateral processes of the lower head of the tibia and the os calcis, the



capsular ligament of the hock joint is but comparatively loosely attached, or rather, in the relaxed state, *bags* a little; and, being in those parts without any embrace outwardly from ligament or tendon, the moment accumulation takes place within the joint, the capsule at the said places bulges and protrudes at the sides, and so produces the tumours we denominate *thorough-pin*. This view of the pathology of thorough-pin explains why the swellings disappear at the time the hock is flexed, and reappear the moment the act of setting the foot down upon the ground causes extension of the joint. Flexion occasions tension of the capsule and pressure of the fluid (*synovia*) into the interior of the joint; extension on the contrary, relaxes the capsular ligament, while the reflux of the fluid into it occasions the bulging; the bulging taking place at the sides for the reason of there being thereabouts no ligaments or tendons to oppose the protrusion. We now perceive the reason, too, why thorough-pin has no existence independently of bog spavin. Both anomalies consisting in distension of the hock-joint with synovia, the pressure of the fluid being greatest below, and the capsular ligament being least supported on the inner side, the bulging will take place there—in the site of bog spavin—the first; and when that part has become so distended that resistance begins to be set up—from the skin, and perhaps the vein, as well as the capsule itself—then does the fluid (supposing accumulation still to be going on) make its way into the upper compartment of the joint, and produce thorough-pin. Consequently, in the normal or ordinary state of parts, thorough-pin must for its presence be completely dependent upon bog spavin, though bog spavin does not necessarily entail thorough-pin.

Although we feel no apprehension about this account being perfectly intelligible to persons in the profession who are acquainted with the structure of the hock-joint, yet we are apprehensive it may turn out in some respects not to be altogether so to persons out of the profession; to whom all that we can, by way of solution, recommend is, a view of the parts themselves, either in skeleton or preparation. The fluctuation felt in either tumour while the one opposite is being tapped with the fingers is now likewise perfectly comprehensible.

There is evident communication between the swellings, and this we now know to be through the intervention of the hock-joint.

Thorough-pins, chronic in their nature, existent in hocks undergoing, or that have undergone, great and continued stress from work, with time experience changes, which, if not alike in degree or intensity, are similar to those we have detected in bog spavin. Old thorough-pins, under circumstances stated, lose their pliancy of feel, their elasticity, and their fluctuation; they acquire a substantiality they never possessed before, and are evidently from inward disposition approaching a state of consolidation. To what extent such changes of structure have gone, or may go, we must ask those who have had opportunities of dissecting thorough-pinned hocks advanced in disease to kindly inform us.

OF LAMENESS FROM PURE THOROUGH-PIN we know of no example on record;

TREATMENT, therefore, will hardly be called for.

#### WINDGALL OF THE TENDO ACHILLIS.

DEARTH of names for diseases compels us on occasions, as in the present instance, to substitute some paraphrase descriptive of their seat or nature, or of some other striking attribute, for an appropriate appellation. The French call this disease *vessignon soufflé*; and it has something the appearance of an inflated bladder, running along the "hamstrings" or united tendons of the gastrocnemii muscles. These tendons are enveloped in a cellular sheath, and between is a thecal cavity or sort of *bursa*, lined with synovial membrane, and lubricated by synovial fluid; and this interspace or cavity it is which is the seat of the disease now under our consideration: it consisting, like windgall, in an undue secretion and collection of the synovial fluid.

WINDGALL OF THE TENDO ACHILLIS is comparatively rare. Now and then it is complicated with thorough-pin, but is rarely or never an accompaniment of capped hock.

THE CAUSES of this tumefaction being some extraordinary or unexpected tug, stretch, or strain of the hamstrings, and par-

taking as it sometimes does more of the nature of thecal sprain than of pure windgall.

LAMENESS IS AN OCCASIONAL ACCOMPANIMENT, a constant one, Hurtrel d'Arboval says ; but our own practice has not appeared to confirm this. Should lameness be present, the case of course would call for

TREATMENT.—And this should be commenced by lengthening the caulking of the shoe of the lame limb ; it being of great consideration towards cure to diminish, to the utmost possible extent, the dragging action of the muscles upon the tendons. This done, spongio-piline fomentation, evaporating or discutient lotions, a brisk cathartic, and absolute repose—the latter to be continued so long as lameness exists—will in time effect restoration of soundness ; though tumour will still, to a greater or less extent, probably remain ; to get rid of which we must employ iodine and mercurial ointments, or, if it be thought worth while, sweating blisters.

#### WINDGALL OF THE KNEE.

THE large extensor muscle of the cannon (*extensor metacarpi magnus*), and the principal extensor muscle of the foot (*extensor pedis*), taking their origin high up upon the arm become tendinous a little above the knee, and their tendons, as they pass underneath the anterior annular ligament, run through synovial sheaths, furnished with *bursæ mucosæ*. These vaginal bursæ frequently—indeed commonly—are found to communicate with the middle joint of the *carpus* or articulation formed between the two rows of small bones ; consequently, the synovial fluid freely passes during the motions of the knee-joint from the bursal cavity into that of the joint, and *vice versâ*.

IT IS THESE (*carpal*) BURSÆ which are the seats of the disease called “windgall of the knee.” They become enlarged in consequence of anormal collections of synovia in this middle compartment of the knee-joint ; and the augmented secretion of fluid is probably owing to causes similar to such as have been already detailed as occasioning the same in other bursæ connected with joints.

The disease is so rare that there are veterinarians, probably,

who may have never seen it. When present, it discovers itself in the form of one or two small round tumours in front of the knee, which from their elasticity and fluctuation evidently contain fluid, and which may, while the foot is off the ground and the knee-joint relaxed, be in general, by pressure, emptied of their contents. They are productive neither of lameness nor inconvenience, and are thought nothing of, save they should happen to offend as eye-sores. Strong stimulating applications or blisters might, were it desired, reduce their magnitude; though in general, when they do exist, as soon as their innocuous nature comes to be explained, but little heed is taken of them.

We remember seeing, a great many years ago, a very fine three-parts bred covering stallion, called ALFRED, the property of Major Talbot, of Stone Castle, near Dartford, who had a tumour of this description directly in front of one of his knees. It was about the size of a walnut, and appeared as though it were *double*, or consisted of one tumour over the other. Not the slightest inconvenience in any way resulted from its presence.

A DIFFERENT KIND OF WINDGALL OF THE KNEE is that which on occasions presents itself above as well as in front of the joint, taking the direction of the tendon of the *extensor metacarpi*, of the bursa of which it is an enlargement. In the case which I find I have registered of this description, it appeared to have had its origin in "pawing in the stall," a habit to which Lord C——e's mare—the subject of it—was much addicted; and it was pretty well ascertained that, in so doing, she was continually striking her knee against the manger. This is a different case from that of *distended theca*.

I have likewise seen windgalls upon the tendons of the flexors at the back of the arm, immediately above the knee.

#### WINDGALL IN FRONT OF THE FETLOCK.

THERE are two localities or forms in which windgall shows itself in this region, according as its seat is the superficial or the deep bursa mucosa. In all cases in which the fetlock joints are what we denominate "round," *i. e.*, are evidently full and tumefied *in front*, as well as in other parts, the bursa underneath the extensor tendon is the seat of the windgall,

which, in this instance, is complicated with synovial dropsy or general dilatation of the capsule of the fetlock joint; and this affection, though we are not in the habit of regarding it as "windgall," is, as we all know, anything but uncommon. What, however, more significantly, perhaps more appropriately, is called "windgall in front of the fetlock," consists in a normal distension with synovial fluid of the superficial or subcutaneous bursa thereabouts, producing puffy elastic tumours, palpably visible to the common observer, and bearing all the signs and characters of ordinary windgall. Windgalls of this latter description are but rarely met with: I may, in my time, have seen half-a-dozen instances—certainly not more.

I remember a grey carriage horse being brought to me in June 1848, exhibiting windgalls in front of the fetlocks of both fore legs, the tumours not being directly upon, but rather above the joints. They were oblong rather than globular in shape, and were about the magnitude of sections of hens' eggs. The tumour upon the off leg had been there for two years; that upon the near, but one. Vesicatories, and iodine and mercurial ointments, had been made use of: the latter having been found to answer best, though neither appeared to have done much good. I was asked my opinion about the case. My answer was, "Two courses of treatment appeared open to trial: the one was *puncturation*; the other *firing*." The tumour being moveable underneath the skin, and having no traceable connexion with the joint, seemed a fair subject for a small trocar. On the other hand, should danger be apprehended from such an operation, certainly light firing could do no possible harm, and seemed to promise to have the effect of constriction, and so ultimately of causing absorption. The horse showed no lameness whatever.

Another instance of the disease is a troop horse now serving in the First Life Guards. H, No. 4, black mare, has a windgall in front of the off fore fetlock, directly above the joint, which is oblong in form, and measures from end to end four inches in length, and stretches in an oblique direction upwards across the fore part of the cannon to the inner side of the leg. I cannot say how long the tumour has existed, having but recently discovered it. It is certainly some disfigurement or



“blemish” to the mare; but, beyond that, is not of the slightest consequence.

#### WINDGALL OF THE HEEL.

Of all, this seems to be the rarest form of windgall. Indeed, it is one which, so far as my reading has gone, remains up to this time unrecorded. On this account, instead of giving any description of it in general terms, I prefer narrating the cases I have registered.

CASE I.—On the 13th January, 1844, a troop horse was brought to me on account of lameness in the off fore limb. On the previous day the horse had been sharply ridden in escorting her Majesty from Windsor to Egham, and there was no doubt whatever that such had occasioned his lameness. There was heat about the fetlock joint, and fulness in the situation of the bursæ at the back of it, and this heat extended down the pastern to the foot. The shoe was removed and left off for a couple of days, and the usual routine of bath and bandage and physic was adopted during the while. On the third day the shoe was replaced. Still the animal went lame. And now, on another examination of the leg, puffy tumours were discovered, one on either side, immediately beneath the sesamoid bones, reaching downwards and forwards to the extent of a couple of inches in the direction of the lateral processes sent off from the suspensory ligament. There was also a third puffy tumour, intermediate in situation between the lateral swellings, being an enlargement of the bursa occupying the interval left between the divisions of the perforatus tendon for the issue of the perforans tendon. Between this and the bursæ at the sides there is evidently free communication; for pressure upon the middle bursa, below, immediately empties it, while it distends the bursæ above; and pressure upon them reverses this effect. The ordinary discutient lotion, with bandaging and pressure upon the tumours having been tried for several days without benefit, the acetum cantharidum was applied to them. This caused vesication, but not loss of cuticle or hair; and the result was restoration of the horse to soundness without any relapse thereafter.

CASE II.—The next is a case of enlargement of one of the same bursæ without lameness. It is interesting from showing how gradually, sometimes, bursæ become enlarged.

April, 1845, a troop-horse was brought into the infirmary stable for having a puffy tumour of the magnitude of the section of a large walnut, in the hollow of the heel of the hind leg. It was clearly a case of enlargement of the bursa between the perforatus and perforans tendons. The same horse was shown to me six weeks before for having a sort of pimply fulness in the same place; but at that time, there being no attendant lameness, I refused to admit him. It would, therefore, appear that the tumour must have been growing gradually since my attention was first called to it. The horse evinces no lameness from it. Still, on account of its magnitude, it being regarded as an eyesore, something must be done to get rid of it. The heel is a tender part to blister. And yet experience has taught me that nothing is so likely to summarily disperse such a tumour. Accordingly, the acetum cantharidum was applied in the usual manner with a small painter's brush; and the result was effusion of solid, in place of the fluid, matter into the tumour; which, ultimately, became reduced almost to nothing.

CASE III.—Another horse, an officer's charger, had been known to have for five years bursal tumours in the same situation, in both fore heels, not so large as the one above described; but no inconvenience had resulted from them. The owner of the horse would not admit that they were *windgalls*.

There exist some structures in the body which, albeit from their make or situation, or from both, they are by anatomists regarded as *bursæ*, are not found to contain synovial fluid like proper *bursæ mucosæ*, though still they appear to answer similar purposes. Between the tendons of the subscapular and coracobrachial muscles is a spurious bursa of this kind; another covers the summit of the olecranon; a third forms the cap of the hock. To the diseases of this class of bursæ I am now about to draw attention; and, first, to

#### CAPPED HOCK.

SUCH is the NAME given to any fulness or actual enlargement of the natural cap or point of the hock. French veterinarians

call the swelling a *capelet*, whence our old writers on farriery have derived their word *CAPULET*, the appellation they have given to capped hock; though why they have changed the *e* into an *u* is not very apparent.

THE POINT OF THE HOCK is a part notorious to every horseman. It is constituted of the tuberosity of the *os calcis* or hock-bone, and serves as the powerful lever whereby the "hamstrings" or tendons of the *gastrocnemii* muscles are enabled to perform so important a part in progression. These two tendons, as they descend along the back of the thigh to the hock, twine round each other in such manner that the outer tendon belongs to the inner muscle, the inner tendon to the outer muscle. The latter is inserted into the tuberosity, and there terminates; but the former (or outer tendon) as it approaches the tuberosity, expands and forms a cap for it, and so becomes a very complete bursal structure; whereby it is enabled, in its subsequent course to the foot, to play over the inserted tendon freely and without friction. This internal or tendinous cap is surmounted by an external, subcutaneous, fascial cap, which, from its being formed in the midst of an abundant cellular tissue, is, together with the skin covering it, extremely loose and moveable upon the tuberosity. This, the outer cap, differs from the inner one not only in structure and completeness of cavity, but also in its contents; it being, in fact, naturally, little else than the semblance of a cavity, having no more indications of fluid in it than would arise from the presence of *halitus* within the cells of its parietes during life. But,

IN A DISEASED CONDITION—for this is the usual seat of capped hock—its state is different. Augmented secretion is excited, and this condenses into serous fluid, collects, and becomes confined within the cavity now perfected by adhesions cementing together the cells of the surrounding porous tissue; so that in a very short space of time distension becomes visible around and upon the point of the hock. In reality, therefore, capped hock is no more than a serous abscess, attracting particular attention from its situation, and exciting the concern of the master of the horse in something like equivalent ratio to its dimensions, or to such estimate as he may in his own mind come to of its deformity. So short is the time in which capped

hock on occasions arises that its origin is often said to be "sudden." The groom quits his stable overnight, seeing his horses "all right," and on his entry next morning discovers one of them to have a capped hock. The history, as he full well knows himself, of which is, that the injured horse has been kicking in the course of the past night, and somehow or other has contused the point of his hock. The swelling, globular in shape, and as large round as an Orleans plum or a small orange, imparts warmth when pressed by the hand, shows some tenderness when squeezed, and at the same time conveys a sense of elasticity and fluctuation to the fingers. Should it be punctured or cut into in this recent condition, yellow serous fluid, similar to what runs from serous abscess, is discharged.

In this stage of the disease little or nothing besides prevention of repetition of injury is requisite to ensure the gradual, and in time complete, subsidence of the swelling. But too often, however, it happens that the kicking is renewed, perhaps the following night, the consequence of which is still further enlargement of the cap, together with, should it not have come on at first, the supervention of inflammation in it. In this way the swelling may attain the magnitude of a small gourd, and even a larger size than this, becoming not only a great deformity, but a tumour of a frightful and alarming character. Nor will matters make an end here; for, in time, whether there take place absorption of the collected fluid or not, morbid changes will ensue in the condition of the external or sub-cutaneous cap. From being thin and simply fascial in texture, it becomes thick and fibrous, tendinous even in substance. Neither will the skin clothing the cap remain unaltered, but likewise will become thickened and indurated. In old and callous capped hocks we readily detect with the hand these changes of structure; and, supposing we are bold enough to puncture them or introduce setons through them, the trocar or seton-needle will be sure to betray the change the parts have undergone in the additional force required to penetrate their several tissues.

Even when operations of the kind are undertaken under different circumstances, they are very apt in the end to leave behind them changes (should they not be already in existence)

such as I have been just describing; though the immediate and pretty certain result of making a wound into a capped hock is suppuration or abscess of the cavity. This it is that makes the puncture of capped hock a dangerous experiment, the suppurative action not only on occasions creating a great deal of alarming inflammation and swelling in the limb, but giving rise sometimes to constitutional irritation as well. I have known a pint and a half of pus to be collected within the morbidly enlarged cap, owing to abscess induced by the operation of setoning. This is what we call

ABSCCESS OF THE CAP, a case I have no recollection of having seen happen but under circumstances of treatment, and mostly after operation. In such a condition of hock and limb as abscess commonly engenders, the features of the case become, as a matter of course, materially altered. Pain and lameness will now be the consequence of inflammation and swelling. Instead of having to treat the hock alone, we are called on to administer to the entire limb, and perhaps to the system of the body as well. And after we have been fortunate enough to allay all irritation, to reduce the swollen limb to its natural size, and to bring back the hock to *statu quo*, still is there likely to remain, and permanently so, a good deal of callous enlargement and deformity of the parts diseased, as well of other parts in their immediate vicinity.

THE INTERNAL, TENDINOUS, SYNOVIAL CAP OF THE HOCK now and then participates in the disease, though never in itself the primary or principal seat. Knowing, as we do, what susceptible structures bursæ are, it is not to be expected that any great amount of inflammation should exist in their immediate vicinity without some sympathy on their part; and therefore we have a right to suppose—indeed, to infer, as far as proof can through manual examination be afforded us—that no great deal of lesion befalls the outer cap without the inner one becoming, sympathetically perhaps, affected. M. Rigot, however, doubts this. He imagines the tendinous cap is too closely bound down to admit of any accumulation of fluid.\*

\* Les moyens d'affirmissemens sont si puissants, et en si grande nombre, que je doute fort qu'il puisse jamais présenter ce genre d'altération.—*Anatomie des Animaux Domestiques*.



THE CAUSE OF CAPPED HOCK is, in two words, *external injury*. The horse's hind legs are used as weapons of attack and defence, as well as instruments of progression. When not fatigued by labour during the day, he will on occasions, particularly if he be viciously or playfully inclined, pass part of the night in kicking against the heel-post or partition of his stall, and in doing so can hardly fail to strike and bruise so prominent and vulnerable a part as the cap of his hock. Kicking in harness against the splinter-bar is likely to be attended by the same consequences. A horse may bruise his hocks by slipping down upon his haunches. Even lying down upon rough stone pavement without litter has been known to produce contusion of the caps. In fact, a contusion or wound of any sort will have the effect. We need, therefore, not express any surprise at encountering so many capped hocks in our daily perambulations.

In answer to some inquiries I made, Mr. Braby, Veterinary Surgeon to Messrs. Barclay and Perkins' Establishment, whose accuracy of observation and experience enables me to write confidently on the point, informs me, that the spreaders, dangling about cart-horses' hind limbs, being too high placed to strike the hock, are apt to produce (not capped hock, but) a thickening of the skin, with, sometimes, abrasion, of the part of the thigh immediately above the point of the hock; and he adds the instructive fact, that the hock of the cart-horse is nothing like so obnoxious to disease in general as that of the light horse. The cart-horse's hock ailments principally arise from his being thrown upon his haunches in the act of backing loads: this often occasions contusion of the cap of the hock (as well as of other parts), which is followed by more or less inflammation; and the usual result of this is, thickening of the integuments around the point of the hock, rendered permanent by subsequent induration and callosity of the parts.

A CAPPED HOCK MAY HAVE A CONSTITUTIONAL CAUSE. It may arise in common with tumefaction of other parts, from "humour." What I have, in another place, called "Diffuse Inflammation of the Cellular Tissue"—a disease most apt to fall foul of the hind limb—will produce it. There being such an abundance of cellular substance around the cap of the hock, rendering it an inviting part for infiltration in dropsical or

œdematous affections, readily accounts for the fulness or swelling of this part under circumstances of the kind. And nothing better than this explains the real nature of ordinary capped hock. In such a case, of course, the tumour here will increase and diminish, and disappear altogether, with the swelling in other parts of the limb. As another constitutional, though a much rarer, source of capped hock, may be mentioned rheumatic inflammation of the joint of the hock.

CAPPED HOCK DOES NOT PRODUCE LAMENESS ; not, at least, in any ordinary form. There must be something unusual about the case for lameness to be present. And there is more likelihood of its appearing after treatment than before ; showing that the means employed, when they are violent or such as are uncalled for, are apt to prove worse than the disease. It is possible in a case of capped hock of unusual magnitude, attended with more than an ordinary degree of inflammation, that stiffness may be observed in the motions of the joint, though this hardly ever amounts to actual lameness. It is after bold and violent treatment, such as blisters and the operation of puncturing the distended cap, that lameness is most apt to come on ; but, then, this arises from extension as well as aggravation of disease, and, properly speaking, has little or nothing to do with a pure case of capped hock.

THE TREATMENT OF CAPPED HOCK, in the form in which it ordinarily presents itself, is really more a matter of choice than of necessity. So far as the animal's utility is to be considered, he is quite as serviceable with a capped hock as without one. And yet, having it, he carries about with him a great disfigurement : at least, such it appears to my eyes, though there be those who are of opinion that some enlargement of the cap of the hock rather adds to than detracts from the fair proportions of the hind limb. Other persons there are—and I must confess myself to be among the number—who so dislike to behold a capped hock, that, as long as any chance of its reduction remains, they are incessantly desirous to get rid of the deformity. I say, “so long as appearances hold out any prospect of reduction,” because, when the enlargement has continued long enough to have become callous and changed in structure, medicine ceases to have any effect upon it. Let the case,

however, be never so recent and favorable, we prescribe in vain so long as the excitant of the evil continues in force. This, consequently, becomes our first solicitude; a branch of our subject which may very well be described under the heading of

PROPHYLACTIC TREATMENT.—In a recent case of distension of the cap, consisting as it does then simply of a collection of serous fluid, the abstraction of the cause will be sufficient to cure the disease. But, let a horse who has given himself a capped hock through kicking in the stable continue his kicking practices night after night, and the contents of the pharmacy may be dispensed upon his ailment to no purpose. Once, however, removed into a situation where he will have no inducement to kick, or should he again kick where he can do himself no harm thereby, or else without removal be hindered from kicking, there will then be a prospect of the enlargements of his caps either subsiding of their own accord, or being readily made or assisted so to do. Cases of capped hocks are frequently occurring in large studs and horse establishments where the labour the horses have to perform is not a counterbalance to their high feeding and grooming, and especially where, as in our cavalry stables, bails, and iron ones, are made the economical (?) substitutes for stalled partitions. Under such circumstances as these, as every veterinary surgeon in the army can testify, capped hocks are not the least among the evils arising from the “bangs and blows” continually befalling horses in such prison-like and comfortless habitations.

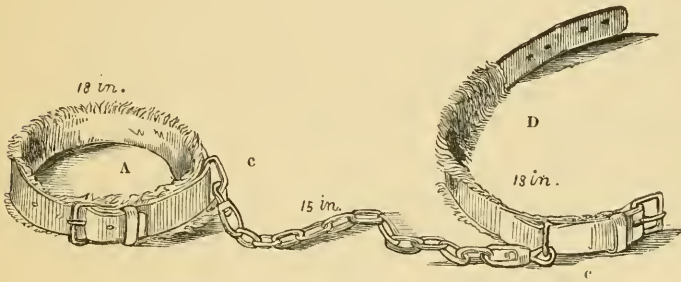
When, therefore, a horse is brought for treatment having a capped hock, the first thing to be attended to is the removal of the exciting cause, so as effectually to prevent the repetition of the mischief. Supposing kicking in the stable to have produced it, and the heelpost of the stall to be the offending or rather the offensive body, either let the post be wrapped in some soft material—such as padding or hay-bands—which will save the limb from injury should the horse kick against it again, or else let his leg be so fettered that he is deprived of the power of kicking; or, should he manifest a propensity to kick on one side only, let him either be removed into a corner stall where his kicking member will be opposed to the wall, or let some furze be nailed against the obnoxious side of the stall

or stall-post, which will disincline him to renew the contest in that direction. Should the kicking appear to have excitement given to it through some play or disagreement with his neighbour in the adjoining stall, let one or the other horse be removed into a distant stall or another stable. In a bailed stable, a very simple contrivance has answered all the purpose of a furze or prickly thorn branch without having the objections to which the prickles in such stables are subject. This consists in procuring a piece of coarse linen cloth, of an oblong shape, and dimensions regulated by the height of the bail from the ground—say four feet by three—and stitching it to the bail in such manner that it hangs down, as a swing partition-board would do, between the horses' standings. There is nothing, it is true, anywise resisting in this linen partition, and yet it is found to answer the purpose of an opposing body, insomuch as it has the effect of intimidating the animal from striking at it, for a time indeed of approaching it. This scarecrow sort of influence it might be thought would wear out; and to a certain degree no doubt it does so, and sooner, of course, in some instances than in others; still, the impression, from the probability of the kicking being renewed, will be likely to be revived from time to time, since the balk the act of kicking produces operates in refreshing the apprehension.

Should nothing by way of prevention we can devise for the stall have the desired effect, we must have recourse to means of shackling or fettering the limbs. In the choice of these—for several methods are in practice—we must be guided by the disposition and irritability of the kicker, lest the remedy turn out worse than the disease. A well-lined hobble-strap with six or eight inches of chain attached to it, buckled on immediately above the hock, so that the chain dangles down the leg, and strikes it every time the animal kicks, giving him "a Roland for his Oliver," is a common and frequently an effectual contrivance to break the vicious habit. Should the chastisement it inflicts, whenever a kick is made, prove insufficient, a wooden log or iron weight may be appended to the chain. This failing having the desired effect, fettering both legs together may be tried; it being borne in mind, however—what I have just now begged attention to—that

whatever the nature of the stop or impediment to kicking had recourse to, it must on no account be persisted in to the animal's detriment; though it but very rarely occurs, under proper management, through gentle and gradual application—applying the shackles or fetters for some few days, at first, only during the day and at such hours as the groom is in the stable—that a horse cannot be brought to wear either continually, by night as well as by day; the latter, if not the former, being a complete let to the exercise of the kicking propensities.

THE PATTERN OF FETTERS I have found to answer best is shewn in the subjoined woodcut:—



Length of chain, including swivels, 15 inches.

A, hobble lined with soft material.

c, c, Swivels, to turn freely, to prevent kicking or entanglement of the connecting chain.

D, Length of hobble when extended, 18 inches.

The fetters may be buckled on, either above the hocks—in which case the connecting chain should be but 13 instead of 15 inches in length—or, what my experience has pointed out to me as the preferable place, around the pasterns (below the fetlocks), which is more coercive than the confining of the hocks; added to which, an objection to the latter situation is that the hobbles in the course of time are apt to chafe the small of the thighs, and leave white marks around them. With young or unbroken horses we must be more scrupulous in our precautionary measures than we need be with others; and in the case of any particular shyness or timidity, our first essay had better be restricted to a single hobble, without any



appendage, buckled round the thigh, leg, or pastern, as seems most prudent; proceeding afterwards by the steps already pointed out, until we succeed—should such be required—to the enduring of the perfect fetter. Cautious and prudential management, I may repeat, will rarely in the end fail of complete success.

MEDICAL TREATMENT.—It is hardly necessary to observe, after what has been prefaced, that no practitioner would think of entering on the medical treatment of capped hock until he had become satisfied that every liability to fresh injury had been removed; and when this is done, the success of treatment must entirely depend upon the state the diseased part is left in. So long as the case be recent, and consist of no more than the effusion of fluid, without any structural change of the cap, little else is required further than the abstraction of the cause to, in time, ensure the subsidence of the enlargement. A dose of physic, fomentation, evaporating or refrigerant lotion, and walking exercise, will accelerate the reduction: withal however, do what we will, a capped hock will take some time in disappearing, and this period will be lengthened according to the character and magnitude of the enlargement. Instead of dallying with such a case as this, however, or throwing the horse out of work on account of it, the advisable plan of proceeding is, as soon as the horse has gone through his physicing, and that and the fomentation, &c., have carried off any existing inflammation, to return the horse to his work, treating the swelling during the while with perfrications night and morning with some iodine and mercurial or antimonial ointment. Supposing the application does but doubtful good, the hand-rubbing will, at all events, tend to promote absorption of the collected fluid.

If we make our minds up to carry matters further than this, we may proceed to blistering the cap; and, in combination with purgative and diuretic medicine, and topical bloodletting so far as it can be practised, I do not know a more effectual disperser of the tumour. At the same time, it must be remarked, there are few persons who would like to give up a workable horse so long as a sharp blister—the most effective one in the end—would require. On this account a sweating blister

is commonly preferred ; which ought to be sponged off as soon as it has elicited discharge, and the sponging repeated daily, and then a horse after a week or so may be taken to work again. Stimulating as a blister is, its application had better be suspended so long as any inflammatory disposition is continuing ; and even then, when applied, it will be found at first to augment the tumour, and in some cases considerably. Physicing and fomentation—and bloodletting if necessary—will, however, soon again reduce it, and then will follow sensible and comparatively speedy diminution of the swollen cap.

PUNCTURATION OF THE CAP.—In the instance of any enormous enlargement of the cap, it may become advisable to give exit to the contained fluid ; though, for my own part, I feel it my duty to say, this is an operation which experience has taught me to defer to the latest possible period. I have had so many reasons for aversion of puncturing the distended cap that nothing but sheer necessity now drives me to it. A very small (surgeon's) trocar is the best instrument to use for drawing off the fluid ; and, first, an aperture should be made upon the *superior* side of the tumour, letting the inflammatory consequences from that subside before any attempt be made to make a similar perforation opposite to it, through the inferior parietes of the tumour. To prevent the upper orifice from closing, it may be probed daily, to let off any collected fluid ; also the inferior opening, after it is made, may for a time be served so likewise ; and, when irritation has sufficiently subsided, a seton of some twisted silk may be run through the cavity of the cap. This will produce suppurative action, should it not have come on before ; and after such action has become completely established, and is on the decline, the withdrawal of the seton will probably be followed by the granulative process, closing the apertures and obliterating the sac ; leaving after all, however, more or less thickening and induration of the cap. This, at least, is the desired progress and termination of the case. Now and then, however, matters go on very differently. Inflammation and swelling to an alarming degree follow puncturation of the cap ; the limb swells to a great size ; constitutional irritation to a greater or less amount supervenes, and we begin to wish we had never operated. Some French veterinarians have,

however, carried the practice much farther than this ; they have ventured upon

THE INJECTION OF BURSAL SWELLINGS after having penetrated them, which has appeared to me a still more hazardous proceeding. Nevertheless, a French surgeon—M. Velpeau, professor at La Charité—having practised with much success the injection of tincture of iodine, diluted, instead of solutions of zinc, in cases of hydrocele in man, M. Bouley (the younger), a French veterinarian of celebrity, resolved to give the same a trial in practice on horses having enlarged bursæ and joints. The latter, however, from woful failures, seeming to infer some sort of contradiction to the statements of the former, the Alfort College very properly took the affair up, with the determination, so far as veterinary practice went, of setting the question at rest. Accordingly, a horse having “ a puffy tumour growing upon the outer side of the hollow of the hock, attended with some slight lameness,” who had been twice fired to no purpose, and who had now a similar tumour growing opposite to the former on the inner side of the hock—who in fact, as far as we can understand, exhibited an unusually large and inveterate thorough-pin, the diseased hock being altogether pretty well double its natural size—had for it the following operation performed :—The horse being cast, a (small) trocar was plunged into the dependent part of the swelling. The withdrawal of the stilette was followed by profuse efflux of limpid synovia, both tumours being manipulated in order to completely empty them. This being done, three syringesful of iodine mixture—one part tincture to three parts water—were injected, which proved barely sufficient to distend the sac as before. The injection was suffered to remain in, three minutes, after which every pains were taken to squeeze all of it out. The horse walked to his stable lamer than before ; and the pain and lameness increased, and slight fever ensued. Both fever and lameness, however, gradually abated, so that, after three weeks had elapsed, his owner being of opinion the animal was fit for work, took him away. Nothing was seen or heard of the patient for upwards of three months afterwards, when he was by special desire brought to the College for examination. So reduced was the diseased hock found, that no more than one-and-a-half inch

remained between its measurement round and that of the healthy hock, notwithstanding the time had been when the former exceeded the latter by fourteen inches.

CASE II, however, although similar in its general character, proved, under like treatment, fatal. An entire cart-horse exhibited his near hock nearly double the size of the off, from the presence of a very large thorough-pin, which had been several times fired. The diseased hock measured twenty-two inches, the sound hock fifteen. The tumour is low (compared to the one in the former case), and there is accompanying it enormous distension of the capsule of the hock joint. Nevertheless, the subject being given up for experiment, the operation was proceeded with. The trocar was introduced, and a pint of synovia flowed out. The iodine injection was thrown in, and retained three minutes within the cavity. But the whole of it could not be made to pass out again, in consequence of albuminous matters, discovered to have become effused into the cavity, obstructing the aperture. After the animal had risen, albuminous synovia flowed from the opening. Pains in the limb and fever followed; and on this supervened swelling, in particular of the hock joint, which at first fluctuated as though purulent matter was collected, and afterwards emitted a viscous colourless discharge containing pus-globules. This went on to ulcerations appearing, and these gave vent, in places, to pseudo-membranous discharges from the joint, having spots upon them indicative of gangrene, which at length was found to have commenced within the joint, under the resorption of the ichor. And of gangrene, as was presumed, the animal at length sank.

The sacs of the thorough-pin were found inwardly rose-coloured and mammillated, the same as in a suppurative wound. Within them was a yellowish-white soft matter, apparently albumen, coagulated by the alcoholic injection. They exhibited gangrenous spots, and had the characteristic fœtor. There was found a communication between the sacs and the hock joint of above an inch in diameter. The synovial membrane lining the hock joint presented the same aspect as the lining of the sacs. The middle protuberance of the tibia and the trochlea of the astragalus, which had a yellowish tint, had

(from absorption) lost their cartilaginous coverings, the bones being bare and soft.\*

An ingenious method of operating on encysted tumours—into which it is so desirable to prevent the ingress of air—was devised some years ago by Mr. Worgrove, a surgeon. Writing† on the treatment of what surgeons call “house-maid’s knee,” he directs, after the exhibition of a brisk purge, that an operation be performed on the dropsical tumour, as follows:—Make an incision one-eighth of an inch in length along the outer margin of the tumour; then introduce a very small bistoury obliquely into the cyst, at such a distance from the cutaneous incision as prevents the escape of any fluid. With the bistoury in the sac, scarify the interior in several places; then withdraw the instrument, and empty the cavity of its contents. Afterwards, apply a compress and bandage, so as to prevent the possibility of any influx of air. Whenever we entertain any thoughts of operating on bursal tumour in the horse, some such method of procedure appears to me safer than the common operation, and particularly when that is intended to be followed by injection; and quite as likely also, in the end, to prove effectual.

#### CAPPED ELBOW.

Akin to “capped hock” is the disease I am now about to describe under the analogous appellation of *capped elbow*.

THE POINT OF THE ELBOW, a part as familiarly known to a horseman as *the point of the hock*, exhibits under disease the same rotund fulness or enlargement as in either case is signified by the epithet “capped.” And anatomists know, that, while there exists a correspondence between these “points” or protuberances in relative position and structure, there can be discovered sufficient analogy between their diseases to warrant the placing of the affection we are about to consider in the same nosological category with capped hock. Over the olecranon of

\* Fuller accounts of these two cases will be found in ‘The Veterinarian’ for 1847, vol. xx, p. 280-5.

† In ‘The Dublin Medical Press,’ 26th September, 1842.



the ulna, the same as over the tuberosity of the os calcis, the skin is hollowed out into a sort of cap; interposed between which and the bone beneath are several concentric, dense, and yet loose, layers of cellular tissue, which render the cap in every direction extremely moveable, while they admit of free and complete flexion of the elbow joint. And these layers are so arranged that an imperfect sort of cavity, having some resemblance to a bursa mucosa, is formed in the midst of them, which, as in the case of the correspondent formation upon the point of the hock, in the normal state appears to contain nothing beyond a kind of serous vapour, such as is exhaled into the cells of the reticular tissue of the body generally.

IN A STATE OF DISEASE, however, the exhalation becomes augmented to that degree that the vapour condenses into a serous fluid, and as such collects in the cells of the reticular tissue clothing the point of the elbow, stretching the cells, and causing them to break one into another, so as ultimately to form one large pouch, or two or more small ones, for the collected fluid. Capped elbow, therefore, like capped hock, is no more at the beginning than *serous abscess*, though in time the serous may become changed into solid albuminous deposit; and this, in its turn, take on a suppurative action. Under unusual excitement, from the very first, solid instead of fluid matters will be effused, or there may be a combination of both; and the solid deposition, unless timely dispersion of the tumour be effected, will, in the course of time, become altered from mere lymph matter to hard fibro-cartilaginous substance, having a yellowish-white aspect, and looking like what is commonly called *callus*: the forthcoming change being one of a scirrhus nature. Upon the surface of this scirrhus tumour, now and then, suppurative action will spring up in places, giving rise to little abscesses, which will burst, and leave behind them ragged nasty-looking sores, leading into sinuses, and evincing little disposition to heal; in which foul intractable condition the tumour may, uncorrected, continue to annoy the animal even for years. Sometimes the tumour is *encysted*, *i. e.*, is contained within a sac, formed around it by the condensation of the contiguous cellular tissue; and when this is the case, a simple operation gets rid of the enlargement at once. Sometimes,

however, the tumour is found to be on every side attached, and to have a broad basis, whose root, it is possible, may run deep enough to cling to the capsule of the elbow joint. This renders extirpation difficult and dangerous.

THE MAGNITUDE the tumour in question is likely to acquire will, of course, be regulated by circumstances. Aggravating causes, and especially when they come to be often repeated, will occasion so much secretion and deposit through the inflammation they give rise to, that very large tumefactions will be the consequence. The ordinary magnitude of the tumour is that of a small apple; but it may grow as large as a very large apple, or a melon, and, when solid and substantial within, its weight tells considerably. Mr. Braby had occasion to excise one off a dray-horse, he informed me, weighing seven pounds!

LAMENESS is not an accompaniment of capped elbow, no more than of capped hock, unless under extraordinary circumstances. When the tumour comes to acquire enormous bulk and weight, or to exhibit sores upon its surface, lameness may be occasioned by the inconvenience and impediment to motion of the elbow joint it causes, or by the pain or soreness produced on motion.

CAPPED ELBOW IS CAUSED by contusion of the part we call *the cap*. Usually, it originates from a horse bruising his elbows in lying down, either against the heels of his fore shoes, or against his forehoofs, or, maybe, against the rough hard pavement he lies down upon. As one proof that such tumours arise in this manner, horses who do not lie down are never troubled with capped elbows. And to show that the calkings have most to do with the causation, horses having their shoes turned up—such as cart and dray and farm horses—are the common subjects of the disease. The same fact will also teach us how to prevent them, as well as suggest a necessary precaution in their cure or removal.

THE CURE OR REMOVAL OF CAPPED ELBOW admits of a bolder practice than does capped hock. The reason for which is, that, while the latter is ever contiguous to a bursal cavity, the former is, in general, too remotely placed from synovial tissue to afford any ground for apprehension on that score. Therefore, so long as the tumour retains a fluctuating feel, or, indeed, a soft or

penetrable nature, we without hesitation pierce its substance with a trocar or seton-needle, and fasten a seton of broad tape within it; than which there is no more summary or better practice for its speedy and permanent dispersion. Should such procedure give rise to any painful or alarming inflammation in the tumour or parts adjacent—which has rarely proved to be the case—withdrawal of the seton, with fomentation of the part, and physic, will abate it, and speedily enable us to reintroduce the seton. Indeed, it is possible, the presence of inflammation might from the first forbid, for a time, the insertion of the seton. The insertion ought to be made in such manner that the lower orifice may be completely dependent, *i. e.* in the *vertical* direction. And whether tape or hemp or silk be used, the ends should *not* be joined together—for this would leave hanging out of the apertures a loop, extremely dangerous from its liability to catch in something, and so to be by force probably torn out—but ought to have knots tied in them, large enough to prevent their withdrawal through the holes in the tumour. The seton ought to be retained until the swelling has become reduced to the greatest reducible degree, or until it shall ulcerate its way out.

Either from the hard consistence of the tumour, or from its long duration, a seton being deemed or proving unavailing, we must turn our thought to extirpation of it; and there is no more ready and safe mode of proceeding with this view than excision with the scalpel. If the tumour happen to prove encysted, the first cut had better be made directly across its free or posterior surface, from above downwards; which done, the tumour will, as the phrase goes, “shell out,” and so leave all that further requires to be done simply to the stitching up of the integument. When the skin, however, proves on all sides adherent to the surface of the tumour, it will be better to make a circular or ovoid incision, carrying it around the broadest circumference of the tumour, or else varying its line of direction according to any ulcerations or tubercular eminences there may be upon its surface which we may be desirous of getting rid of. Caution will be required whenever the tumour appears to have a broad and undefined base; since, as has been already stated, it is not so very unusual for callous

swellings of long standing to have connexion with the capsular ligament of the elbow joint.

#### CAPPED KNEE.

NAME.—If a comparison be made between the account about to be given of the nature of capped knee and the pathological descriptions already given of capped hock and capped elbow, I think I shall be fully borne out in the appropriateness of a similar appellation. Similarity of structure entails similarity of disease; added to which, in the present case, there exists, as we shall hereafter find, similarity of causation.

DEFINITION.—A capped knee is an uniform swelling of the fore part of the knee, having a soft elastic feel, and evincing, so long as it be recent, more heat than the surrounding skin, though pressure fails to show that it is anywise or anywhere painful or even tender.

PATHOLOGY.—When we come to remove the skin from the fore part of the knee, in its normal state, we disclose a layer of dense cellular tissue, covering the extensor tendons for the purpose of protection against the “bangs and blows” to which in this exposed situation they are particularly obnoxious. Cutting into this tissue, we discover in its middle a sort of spurious bursa, leading upwards into a similar cavity upon the extensor (metacarpi) tendons; in which intervals it is that effused fluid collects whenever the knee becomes the seat of serous abscess, or, in other words, becomes “capped;” and this explains the reason why the swelling, as it often is found to do, extend upwards upon the arm. The pathology of capped knee is, therefore, extremely simple. Contusion of the part gives rise to either simply increased vascular action in it, or to actual inflammation; its capillary vessels become surcharged with blood, and they relieve themselves by effusion of, commonly, serous fluid, which collects in the interspaces but now described. At the same time, from the circumstance of the fluid not gravitating, but remaining in one place, it is evident that some agglutination of the cellular tissue around must take place, and that it is contained in a circumscribed sac or cavity. And this sac may, from subsequent distension, through absorption induced by the pressure of the fluid, burst into one of the

true *bursæ mucosæ* situated underneath it—most likely into that belonging to the tendon of the *extensor metacarpi* muscle. When horses fall down and bruise without breaking their knees, extravasation of blood is apt to follow the accident, and this usually becomes dispersed without being followed by serous abscess. A less violent injury will produce capped knee; it may even arise without any injury at all: like serous abscesses in general, however, when once it has arisen it is by no means disposed to subside; but, on the contrary, very often proves extremely obstinate, and now and then under treatment gives rise to solid in exchange for fluid deposition, inducing consolidation of cellular tissues, and thickening of the skin covering them, perhaps, as well. It may happen, however, that the case may take a totally different turn. Instead of proceeding to terminate in resolution, or in permanent consolidation and thickening of parts, fluid may remain effused in such quantity, and for so long a time, as may, in the end, compel the person in attendance to open the abscess to save its bursting. Perhaps serous fluid or sero-purulent mixture may be let out at first, but afterwards pus becomes secreted, and true abscess presents itself. Or, from the swelling forcing itself against the bursa underneath it, the latter may break, and synovial fluid be discharged. This renders the case protracted, but not dangerous. All will ultimately do well, though, after the healing of the abscess, thickening causing blemish will, for some considerable time, probably remain.

CAPPED KNEE IS OCCASIONED BY A BLOW OF SOME KIND. Either the horse strikes his knee against the manger or against the log swinging at the end of his halter. Some horses, from a habit of pawing in the stable—one they commonly acquire from impatience manifested at the time of feeding—are very apt to inflict upon themselves such injuries, and, in consequence, to become disfigured, blemished, perhaps, for some considerable time, to the no small annoyance, in the case of their being choice or valuable, of their proprietors. Horses at strawyard are frequently in their gambols striking their knees against posts or rails, or anything that may happen to stand in their way; and since such accidents are little heeded at the time, but left to work their own reduction, every now and



then it turns out that in one of them the fluid collects to that extent that no mode of cure remains save that of opening the abscess. In dropsical or œdematous affections of the limbs, and rheumatic inflammation of the joints, we may frequently observe the knees to be swollen in front to a considerable extent; though, perhaps, we should not call such by the name of "capped knees."

LAMENESS IS NOT A CONSEQUENCE OF CAPPED KNEE. No pain exists to produce it. The cap of the knee, however, may be swollen to that degree that inconvenience or impediment to the flexion of the knee joint may arise, altering the gait by the peculiarity which it occasions in the lifting and projection of the limb, and so far causing "stiffness," or, if persons will have it so, "lameness." Indeed, it is possible for inflammation from particular causes—such as violent injury, oppressive work, or mal-treatment—to be set up in the part, and then, as a matter of course, lameness would result.

TREATMENT might be said to be hardly called for to so trifling an affair as a capped knee; and yet, so long as the enlargement continues, scarcely anything—unless it be a capped hock—disfigures a horse more. Supposing it be but a casual occurrence, a mere accident of the moment, and there be no probability of any recurrence of the cause which has given rise to it, all that need be said about treatment is—"let the swelling alone, and in time it will subside." As with capped hock so with capped knee, the grand consideration is, the removal of the exciting cause. Should it arise from pawing in the stall, let the horse's fore legs be chained together with fetters of the same kind as were recommended in speaking of capped hock; and should the injury take place in strawyard or paddock, or place of such description, it is most prudent to at once remove the animal.

Severity or repetition of injury may, however, bring before us for treatment a case of tumour, so great an eyesore from its magnitude, that the proprietor is ashamed or unwilling to use the horse with it, notwithstanding the swelling may nowise interfere with action. Now, simple as this case may appear, I would advise the veterinarian not to undertake the treatment of it without warning his employer that capped knee, like

capped hock, is apt to prove exceedingly obstinate, tardy, and tedious of reduction, and to be the more tiresome in resisting remedy, the more remote its date of origin and chronic its nature.

So long as any heat continued perceptible in the tumour, one would naturally feel disposed to commence with antiphlogistic remedies—a brisk dose of cathartic medicine, combined with the use either of fomentations and poultices, or of evaporating lotions, according to the stage the inflammation was in—notwithstanding the experienced in these matters know but too well that but little benefit is to be expected from such remedies in any case save the one which is recent, or such a one as has not lost the natural propensity of parts, give them time, to recover of themselves their normal condition. And even in other cases—cases in which this restorative power seems to have expended itself or to have grown dormant, and wherein fresh action seems cogently called for before absorption of the collected fluid can be expected to be brought about, I have always found that blood letting, either from the shoulder or the toe, with the simultaneous application of a blister upon the swelling, and the combined operation of purgative medicine, has proved more effective than any of the ointments said to promote absorption, such as those of antimony, iodine, mercury, &c.

Now and then, however, it will turn out that, instead of the fresh action excited by the blister producing absorption of the effused liquid, it will give rise not merely to a temporary augmentation—which, indeed, is very commonly the effect of a blister, but—to fresh and permanent enlargement of the tumour, rendering the fluctuation more perceptible than it ever has been, and showing a disposition, the same as any purulent abscess would, to *point*. At this stage operation becomes inevitable. The tumour may be punctured with a lancet, better held to cut longitudinally than transversely; the serous fluid, often stained with blood, let out; and the case treated the same as any other serous abscess, save that setoning is not advisable here, and that, the sooner the parts can be got to granulate by injections, mild at first and increased in strength afterwards, the better. Sometimes it happens that the sheath of the extensor tendon in front of the knee becomes opened

and involved in the abscess, and that synovial discharge is mingled with the serous: should this be suspected prior to lancing, the valvular operation, with scarification, as prescribed for capped hock, might be the preferable mode of procedure. Compresses confined upon the knee by elastic contrivances will be found very useful in promoting adhesion of the scarified surfaces.

## CLASS II.

LAMENESS ARISING FROM DISEASE OF MUSCLE AND TENDON,  
AND OF LIGAMENT UNCONNECTED WITH ANY JOINT.

IN the category of the diseases of muscles and tendons we include those of the coverings of the one and the sheaths of the other. Inflammation frequently spreads from fascia to muscle, and from sheath to tendon, and *vice versâ*; and in the case in which it does not, yet is the muscle rendered incapable or fearful of action through disease of its fascia, the tendon through disease of its sheath. The fasciæ and sheaths are, in general, composed of a tissue so different from the muscles and tendons or ligaments, that, were I to class them in accordance with their composition, they would be more naturally associated, under disease, with the *bursæ* than with the parts they are here connected. Frequent analogies will be observed between the fasciæ and sheaths of tendons in disease and the *bursæ*, on whose diseases we have so recently been engaged; indeed, the sheath of a tendon is little more than a bursa thrown into an oblong or extended shape, save that in the one instance the tendon runs through the cavity or plays *within* it, while in the other it runs and plays *over* the sac.

In many parts the *fasciæ* (or coverings of muscles) and the *theæ* (or sheaths of tendons) are purely membranous in their composition; in others they are manifestly, in part or wholly, fibrous or tendinous, requiring for the purposes they are wanted additional strength and resisting power. This difference in tissue will modify their diseased actions—will render inflammation and its consequences in some respects unlike in the two textures.

FASCIÆ AND THECÆ, being given for support and protection to the parts they envelope, and being external to them—immediately, indeed, in most places situate underneath the skin—are the first parts to receive injury when once the skin is perforated or even violently contused. In any forcible or extraordinary action, flexion or extension, of the limbs, likewise, such parts are more likely to be hurt than the muscles and tendons producing the motion: hence the reason of “sprains”

in general consisting rather of stretch or strain or laceration of the fascia or theca than of the muscle or tendon. How commonly does "sprain of the back sinews," as the affection is called, amount to this only, when the general belief is that the fibres of the sinew itself are either stretched beyond their extensibility, or rather are ruptured. There is no difficulty in accounting for the lameness accompanying such an accident. When fasciæ or thecæ are in a state of inflammation, any motion of them, or of parts connected with them, cannot fail to be productive of acute pain.

## CURB.

THE DERIVATION OF "CURB," there can be no doubt, is from the French word *courbe*; the latter answering to the correlative words, *curvare* in Latin, *corbar* in Spanish, *curve* in English, &c. And yet, in the pathological sense in which we understand the word *curb*, we are unable to find in another language a word like it of the same signification. If we turn to the word *courbe* in D'Arboval's DICTIONNAIRE VÉTÉRINAIRE, our best French authority, we find it defined to be "an *osseous* tumour, hard, of greater or less magnitude, so called because in outline it is more or less *curved*; its seat being *the inner surface of the horse's hock*, precisely where projects the internal condyle of the tibia or bone of the thigh."\* The old French author's, Solleysel's, definition runs not very wide of this. "The curb," he informs us, "is a large and hard tumour, generated of flegmatic matter, *seated on the inside of the hough*, higher than spavin, on the substance of the tendon that strengthens the part: 'tis a long swelling in the shape of a pear *cleft through the middle into two pieces*, higher above than below, and sometimes makes the horse halt."† The "osseous" composition of the tumour being here omitted, were it not for

\* COURBE.—Tumeur osseuse, dure, et plus ou moins volumineux, ainsi appelée parcequ'elle décrit une ligne plus ou moins *courbe*. Elle se développe à la face interne du jarret du cheval, à l'endroit qui repond précisément au condyle interne du tibia ou os du jambe.—*Dict. de Méd. de Chirurg.*, §c., par D'Arboval. 2nd edit. 1838.

† 'The Compleat Horseman.' By Solleysel. Translated by Hope. 2nd edition, 1717.



the erroneous site attached to it, one might pass it for being intended for curb, the "cleaving of it through the middle" being very significant of the shape of the tumour. At all events, our old authors on farriery, succeeding Solleysel, appear to have done so; and in this way we may account for the introduction of the word into our nomenclature.

A CURB MAY BE DEFINED to be, a prominence upon the back of the hind leg, a little below the hock, of a curvilinear shape, running in a direct line downwards, and consisting in effusion into, or thickening of, the sheath of the flexor tendons.

THE SIGNS OF CURB, then, are a tumour in the situation mentioned, possessing heat and tenderness while recent, and which are sometimes manifest in the surrounding skin as well, commonly attended with lameness, and, when the pain is great, with a flexed position of the limb in standing, the animal resting the weight upon his toe.

SITUATION AND DIMENSION.—The tumour, or prominence rather, rising imperceptibly out of the surface at a distance of from three to four inches below the point of the hock, gradually increases to the extent of one and a half or two inches, and from its middle or most prominent part as gradually decreases, vanishing in the surface of the skin in the same manner in which it took its rise therefrom. This gradual rise and decline of the tumour renders it necessary, in order

TO DETECT A CURB, that the observer should stand *alongside* of the horse's quarter, and not behind him. The eye in this position, running from the point of the hock downward, readily discovers the irregularity or prominence in the posterior line of the limb; whereas, had the view been taken from behind, no swelling would have become visible.

MAGNITUDE.—Although the tumour of curb is never one of any enormous size, yet is there a good deal of variation in its magnitude in different subjects. In some, in young unbroke horses in particular, the rising is too small to be likely to be detected by any save the practised eye, and, as such, is rarely accounted of any consequence; unless it should happen to be combined with what we denominate "a curby-formed hock." On the other hand, every now and then, curby tumours are so prominent and conspicuous that they cause great dis-

figurement, and are apt very much to depreciate the value of the animal.

THE NATURE OF CURB has certainly been but imperfectly understood, or we should never have had such

VAGUE AND VARYING ACCOUNTS of the disease. The funniest interpretation of a curb on record is, perhaps, that narrated by the late Professor Coleman, who learnt it at a horse cause on which he was subpœnaed. Mr. (afterwards Lord) Erskine informed the jury that the *hock* of the horse answered to the *knee* of the human being, and that, as shown by evidence he should adduce (a farrier), such swellings (as curbs) proceeded from a kind of *gout*! Bracken regarded curb in weak "sickle-houghed" horses as an effort of nature to strengthen the parts. Osmer defines curb to be, "a swelling on the joint of the hinder leg, below the hock," but gives no account of its pathology. White considers curb "in nature similar to a strain in the back sinews, and to depend upon the rupture and consequent inflammation of some vascular membranes situated between the two tendons of the gastrocnemii muscles." Spooner (White's commentator) repeats the words of White, "in its nature similar to a strain in the back sinews;" adding, it depends upon a strain and inflammation of the *strong ligament that passes from the os calcis down the back of the hock to the shank bone*, frequently involving the flexor sinews at the same time." Professor Coleman's opinion I never learnt: I find no notice whatever on the subject in his "Lectures."

Blaine heads his chapter on curb, "CURB OR EXTENSION OF THE *ligaments* OF THE HOCK," and adds, in the course of his description, "or of the sheaths of the tendons passing from the hock downwards, as of the *flexor perforans*." Youatt pronounces curb to be, "either a strain of the ring-like *ligament* which binds the tendons in their place, or of the sheath of the tendons; *oftener, however, of the ligament* than of the sheath."

Thus, there evidently exists among the authorities cited considerable wavering of opinion respecting the true or exact *seat* even of curb, to say nothing of its pathology. Whether the disease be seated in ligament or sheath of tendon, or in tendon itself, is left undecided. Such dubious and wavering

testimony might at first seem to reflect heavily upon veterinary writers. And yet, when we come to consider that horses are not shot on account of curbs, and that it is only perchance that a man in practice encounters such things in dead horses, we shall, in part at least, withhold any meditated condemnation. No honest writer, giving results as those of his own observation, can describe what he has not seen : his descriptions must—ought at least to be—drawn from his own practice in speaking *en maître* on such a point as this.

IN GIVING MY OWN OPINION OF THE PATHOLOGY OF CURB, I would, in the first instance, by way of introduction, call attention to the anatomy of the parts concerned. The flattened tendon of the gastrocnemius internus (muscle), commonly called the *tendo perforatus*, after expanding upon the point of the hock to form a *cap* for it, continues its course straight down the back of the hind leg, clothed by cellular tissue, and by means of it connected with the parts around, and thus is confined in its place. In front of the tendon, in the midst of this enveloping tissue, is a serous bursa ; while behind it, between its cellular investment and the skin, is a tendinous band to which has been given the name of annular ligament, whose glistening fibres are seen traversing the tendon evidently for the purpose of binding it down, and so in action contributing not a little to its power and effect.

Now, if we, bearing this anatomical sketch in view, revert to the seat of curb, we shall find that the site of the tumour is directly opposite to the bursa in front of the perforatus tendon. Through this bursa or thecal cavity runs the perforans tendon, and it is the play the tendons enjoy at this particular part, in consequence of the existence of the bursa and the looseness and paucity of their attachments, that causes sprain or laceration to be seated here ; the part sprained or lacerated being neither the tendon nor the ligament, but the cellular sheath of the tendons. When curb is manifested as the *immediate* consequence of the wrench or sprain, we must, to account for such speedy tumefaction, suppose that blood-vessels are ruptured, and blood extravasated. More commonly, however, an interval elapses ere the swelling rises, and in that interval effusions take place, of, no doubt, the ordinary sero-

lymph deposit, and this probably pervades cellular tissue and bursa together. This is accompanied—indeed is caused—by inflammation of the parts, which account for the heat, and for the pain or lameness. The circumstance of inflammation not immediately following the accident accounts for lameness not showing itself in all cases at first. Indeed, in some cases the injury sustained appears too slight to bring it on: palpable curb exists and yet the horse remains all the while perfectly sound. What ultimately takes place in curb, and, in fact, constitutes the disease in the ordinary, inveterate, or permanent form—being the consequence of interstitial deposit—is a hard callous condition of the tumour, and this is the state in which horses are brought to us after inflammation has departed. It consists in a thickened and indurated condition of the cellular sheath of the tendons. Therefore, when we come to dissect curb in this, the usual state of parts, what we find is this: We first cut through the skin covering the tumour. This exposes the annular ligament; underneath which is the consolidated and thickened sheath, fibrous perhaps in composition, altogether changed in aspect and texture from what it was, and measuring, as I have seen it, *half an inch* across in solid substance. A curb, therefore, might very properly be said to consist in hypertrophy of the *sheath* of the flexor tendons. Doubtless, there occur

OTHER MORBID APPEARANCES.—Diseased action may continue, or return, or be reproduced, and so give rise to such. Mr. Mayhew found the tendon of the perforans muscle “perceptibly enlarged,” showing “indications of an inflammatory condition.” He cut into it, “and from the incision pressure caused to exude a *thick dark coloured pus*, of the consistence of cream cheese.”\* The case being one of chronic date, and subject to the suspicion of taint from a malignant disease present, will perhaps be viewed rather in the light of a condition inveterate curb may run on to, than as affording an example of the ordinary pathology of the disease.

In a hock I myself dissected, supposed from its outward appearance to harbour a curb, I found a thorn, half an inch

\* See ‘Veterinarian,’ vol. xx, p. 15.





## PLATE XII.

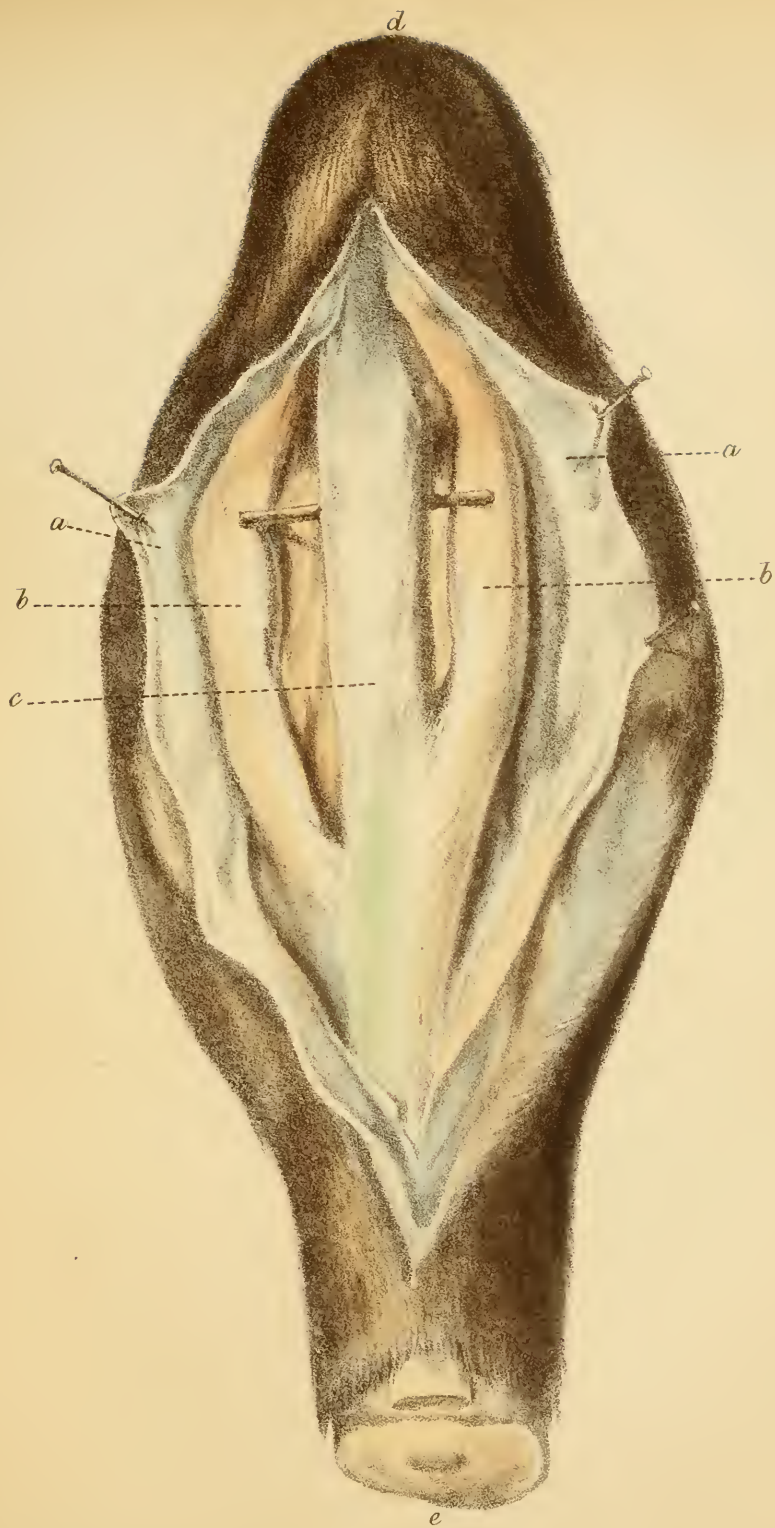
### CURB.

In this posterior view of the hind leg, from the point of the hock to about one-third of the length of the cannon downwards, is displayed a curb, in its ordinary chronic and permanent state, slit open and dissected so as to develop its anatomy.

The subcutaneous cellular fascia, including the annular ligament (*a a*) is dissected off and pinned back, in order to bring into view the sheath of the flexor tendons in the thickened and callous condition (*b b*) in which it is found in—which, indeed, constitutes the essence of—chronic or prominent curb. The sheath has had a longitudinal division made of it, and the divisions (*b, b*) separated, with the view of better showing the augmentation of substance it has undergone, the consequence of disease originating in sprain. This division and separation has brought into view also the bursal cavity through which (the same as in the fore leg) the perforans tendon (*c*) plays, in action. This is the cavity which is distended with fluid in recent, and in some instances has been found so in chronic, curb.

(*d*) The posterior side of the point of the hock.

(*e*) The lower (sawn) end of the metatarsal bone.





in length, sticking in the substance of the perforatus tendon, precisely in the seat of curb.

For reasons I have already stated, viz. the rarity of the occasions afforded us for examining curbed hocks, I should not think of putting my opinions in opposition to the asserted disease of *ligament* in curb—either of the annular, or the external lateral superficial, or the calco-cuboid ligament. All I can say on this subject at present is, that I have not met with disease of the parts in question; and should feel inclined to view such disease, when present, rather as consecutive of, or collateral with, the thecal affection than in the light of the proximate cause of curb.

THE CAUSE OF CURB, investigated, throws a good deal of light upon its nature. It evidently consists in *sprain* or *rupture* of some part; and this part I have shown from my own observation to be, ordinarily, the cellular sheath and bursa of the *tendo perforatus*. A person takes his horse out for a day's hunt, finds him drop all in a moment excessively lame behind, and afterwards, when he comes to search for the cause of lameness, he discovers he has thrown out a curb. The physiological history of an accident of this kind appears to be, that the animal, in going through some slough in the course of the hunt, or over some rough or deep fallow, or in taking some high or wide or awkward leap, or from stepping unawares into a rabbit-hole or mire, has, to save himself from falling while he maintains his pace, been compelled to put his gastrocnemii muscles suddenly, and perhaps unexpectedly, into instantaneous and vigorous action; the result of which has been stretch or "sprain," if not laceration, of the cellular sheath of the perforatus tendon.

Although hard galloping and leaping may be set down as especial causes of curb, yet may the disease be produced in the entire absence of such causes. I have known more than one instance of horses throwing out curbs in the course of even walking exercise. I remember a four year old blood troop mare walking only from the Regent's Park to Wormwood Scrubs and back, and being the following morning brought to me for having "thrown out a curb." Another accident of the kind I recollect happening to another troop (aged) horse,

who was only walked from the Regent's Park to Shoreditch and back, on the occasion of the threatened Chartist disturbance. I do not mean to say that these horses did not frolic and jump about; the probability is that, coming fresh out of their stables, and full of corn, they did so, and that in some gambol the curb was sprung: I mean, however, to say for certain, that neither horse was galloped or leaped. I have been particular in mentioning these two cases, in order to show that what is called violence or abuse is by no means absolutely necessary to the production of curb; and that, on the contrary, curb will sometimes arise, purely the result of accident.

THE HOCK MOST DISPOSED TO CURB is the one we designate *the sickle hock*. In proportion as the line drawn from the point of the hock down the back of the leg deviates from the perpendicular, or, in other words, in proportion as it inclines forwards underneath the body of the animal, so is the hock, by the increase of the angle between the thigh and leg, rendered weak and predisposed to give way: this is especially the case when the thigh happens to be long and lank, as with such conformation of hock it is very apt to be. A horse with such hind-quarters as these is a curby subject, and as such objectionable for hunting or racing, or any kind of work calling for great strength of hock. Added to which, when once such a hock has failed, there exists a constant liability in it to repetition of failure. The best chance of its standing is a reduction of the morbid parts down to that state of thickening and callosity described under the "pathology of curb." This may enable them, when nothing else will, to withstand the force and shock of action. And this it is that accounts for old curbs, although large, not being attended with lameness.

LAMENESS IS A COMMON, NOT A CONSTANT, SYMPTOM OF CURB.—At times, hardly any disease gives rise to more intense lameness than curb; the horse absolutely *walks* lame—seems as though he were literally broken down behind; whereas at other times no lameness is observable; and between these two extremes we may have present any degree of lameness. Usually a curbed horse is too lame to work, or is kept from work by growing lamer every time he is made to perform it. Repose



always benefits his lameness ; exercise or exertion invariably does him harm. Many a horse—in particular, a young unbroke horse—shows for curb, who has never evinced lameness, nor seems likely to do so ; and more horses still show curbs which have been treated—either blistered or fired, and which, in consequence, have become converted into the callous substance before described—of which they are never again likely to go lame.

A curb is reckoned of consequence only in so far as it interferes with the action of the hock or makes it painful, and so far lames or incapacitates the horse ; and it is the fact of there being hardly any instance on record of permanent or incurable lameness from curb that induces horse folks to attach so little importance to the disease. From past experience, they entertain a feeling of assurance that, in the end, all will become right again.

THE TREATMENT OF CURB, with a knowledge of the fact of its universal curability ; or of its tendency, even untreated, and certainty, indeed, in the course of time, provided the horse be laid up, to cure itself ;—I repeat, with a conviction of all this, the treatment may be said to be undertaken under the happiest auspices ; indeed to be undertakeable with tolerable prospects of success by the mere dabbler even in veterinary medicine. Every groom—every amateur veterinarian—can “cure a curb :” still, there is a rational and scientific method of procedure in this, as in all other cases, which we rarely see practised but in the hands of the regular professional man.

Knowing that repose, a state of quietude of the affected limb, is most desirable, the horse is not to be turned loose into a box, but to be kept confined in a stall ; and that the diseased parts, and others connected with them, the tendons and ligaments, may be thrown into a state of relaxation and ease, a most important aid in treatment is a high-heeled shoe. This done, fomentation of the curb with water as hot as the hand can be borne in it, is the best assuasive to the part in pain, and the fomentation is rendered particularly effectual by the employment of the spongio-piline. One piece may be temporarily confined around the hock while another similar piece is soaking in the hot water, ready to succeed the first. This succession constitutes most effective fomentation. A dose of purgative medicine should be given, and it should be an extra

strong one, remembering that the horse will not be able to be moved about to work it off. If we could draw blood, locally, from the part itself, the abstraction would greatly relieve the inflammation present: all that we can do by way of approach to it, is, supposing the inflammation to run high and the lameness to be excessive, to open the femoral vein, or else pare the foot of the curbed limb, and draw blood from the toe. It is not often, however, that it is deemed necessary to abstract blood. On the contrary, it not infrequently happens, in a case of curb taken under treatment at the moment of or soon after its occurrence, that the fomentation and the high-calking shoe, and the physic together, effect a cure, or at least succeed in restoring soundness.

A SPEEDY AND VERY EFFECTIVE MODE OF TREATMENT for what is called by farriers "taking off a curb," is, with the employment of the high shoe, after well fomenting the swollen part, to apply *immediately* to it the *acetum cantharidum* (which has the same effect as what goes under the name of *Leman's essence*). Simply wetting the hair with it by means of a painter's brush, and afterwards tying the horse's head up for the night, is all that is required. In the morning, the discharge caused by the vesicatory may be sponged off by renewed fomentation; and this ought to be repeated day by day afterwards for a few days; at the expiration of which, the physic having worked well in the interval, it mostly happens that the horse will be found fit to resume his work. This treatment for hunters, who are very apt to throw out curbs in their work, and whose services are required speedily again, and in as un-reduced a state of condition as possible, is particularly in request. It is certainly the most speedy way I know of to remove the lameness of curb; at the same time it cannot be lauded as the plan of treatment most likely to restore enduring or *permanent* soundness.

ABOUT COOLING AND DISCUTIENT LOTIONS nothing has been said, because for the most part they require the application of a cloth or bandage; and this, in curb, is no very practicable matter; else, there is no reason why cold applications and evaporating and discutient lotions should not avail as much in curb as in any other description of sprain; and there are prac-

titioners who make use of them (they say, efficient use) by keeping the hair over the inflamed parts continually wetted with the lotion employed. Ice, no doubt, would be an excellent application for an inflamed curb, could it be maintained upon the part. Use what we may in preference to fomentation—the common remedy for the purpose—any inflammation present in the tumour should be drawn out, or very sensibly diminished, before we think of applying a blister in the potent form in which it is for curb or sprain ordinarily administered.

*Corrosive sublimate dissolved in spirits of wine*, in the proportion of ʒj to ʒj, is a favorite remedy with some practitioners; and for slight cases it may answer very well. The hair may be wetted with the solution in the same manner (with a painter's brush) as the acetum cantharidum is recommended to be used; and the part, as soon as the hair has become matted or roughened, fomented. Others there are whose practice it is to form a paste of spirits of wine and pipe-clay, and spread it upon the curb, keeping the plaster continually applied. This is no more than a convenient mode of applying spirits of wine itself, the pipe-clay being simply the vehicle. The same paste has been found serviceable in capped hock; a part to which any sort of bandage is equally difficult or impossible of application.

A BLISTER is the remedy loudly and universally lauded for curb; and for the practical reason that curbed hocks are found to *stand* after blistering, while they frequently fail after mild treatment. It is easy to account for this. An ordinary blister—more severe than a *sweating* one—and especially if the hair be trimmed off, and the blister be a “strong” one, occupies some considerable time in working off, during which an entire change takes place in the organization of the curb. Any inflammation still remaining in the swelling is altogether superseded by the renewed and violent inflammatory action caused by the blister, and internal as well as external parts become involved in it. The consequence is, that the effusion of lymph is still further augmented, the parts inflamed afresh become agglutinated together, and in the end a general thickening takes place, implicating all around, rendering the curb indurated and callous, little organized, and little subject to any renewal

of inflammatory action. By this general consolidation and thickening the motion of the parts, no doubt, is for a time hindered and restricted; by usage, however, the permanent adhesions elongate, giving to the parts they unite, by degrees, looseness and liberty, and so enabling curbed horses, after lengthened laying-up, to perform their work with their wonted effect, and with the advantage of not being liable to fail again in the same parts. I mean, after curbed subjects have been efficiently or repeatedly blistered, or fired if thought requisite, and at the same time sufficiently rested.

THE OINTMENT OF THE DEUTO-IODURET OF MERCURY, made by rubbing up from one to two drachms of the red powder of the mercury with an ounce of hog's lard, has proved, at times, an useful application; so much, indeed, has it grown into favour with some veterinary practitioners that they prefer it to a blister. In 1840 Mr. Wills read a paper on the subject to the Veterinary Medical Association, in which he spoke in warm commendation of the ointment, composed as above stated, as remedial in splints, curbs, windgalls, &c. The ointment may be applied either upon a trimmed or an untrimmed surface, not requiring friction like a blister, nor the head of the horse confining for upwards, at least, of an hour afterwards. A mare was brought to Mr. Wills for opinion, having curbs on both hocks; one of them "large and indurated." The owner was unwilling to have her fired, since that would "blemish her." Mr. Wills thought he could succeed in removing one with the ointment, but was dubious concerning the dispersion of the other. He commenced the red mercurial treatment, and in six weeks "the curbs had quite disappeared." Mr. Wills thinks that this ointment possesses the additional virtue of promoting the growth of hair.\*

IODINE AND STRONG MERCURIAL OINTMENT, singly or in combination, are employed frequently by horse-dealers and grooms from an apprehension of, from the use of other and more efficient remedies, incurring blemish. Such applications, however, are of very little use when the object is the *permanent* removal of lameness; the curb being very apt to recur afterwards, supposing it gives way to their employment.

\* See vols. xiii and xiv (for 1840 and 1841) of 'The Veterinarian.'

FIRING will certainly be deemed advisable in the case of a curbed horse failing after having been efficiently or repeatedly blistered ; indeed may, from the magnitude of the curb or the extraordinary lameness occasioned by it, or from the sickle-like contour of the hock, be recommended in the first instance. The scores may be drawn in straight lines over the surface of the tumour ; though more commonly, the back of the hock is fired *feather-fashion* (see *woodcut*). The high-heeled shoe ought to be kept on during the operation of blistering or firing ; indeed, the horse for some considerable time afterwards had better be worked in calkings, supposing his ordinary shoes not to be furnished with them ; or, if they should be, then the calkings now used had better be made of a stronger and higher description.



FAILURE OF CURE, of established or permanent cure, attaches to every remedial measure employed for curb, though in very different ratio. After fomentations and lotions, supposing soundness to be restored by their use, a curbed hock will hardly stand much exertion. Lengthened repose is the only chance that can be given it to right itself again, and grow strong enough to withstand trial. After a blister, curb and lameness will now and then return ; nay, on rare occasions, indeed, even after a second and a third blister. Most rarely does relapse happen after firing. I have had occasion to fire twice, never thrice. Under ordinary form of curb blistering is all that is required to insure soundness ; and on that account, no horse, unless some unusual circumstances present themselves, should in the first treatment be put to the pain of firing. But when other remedies have failed, there can remain no question of the necessity and superior efficacy of the iron.

#### SPRAIN OF THE TENDON OF THE FLEXOR PEDIS OF THE HIND LEG.

THE seat of this sprain is the inner side of the hock. The tendon in question at this part pursues its course through a synovial sheath, which commences about on a level with the summit of the os calcis, and extends to about one third of the



length of the cannon downward, where it becomes closed. The windgall-like tumefaction occasioned by effusion into this sheath, constituting the essence and outward sign of the sprain under our notice, must be distinguished from both bog-spavin and thorough-pin : to which it can, indeed, have no relation, from the circumstance of those affections being either directly or indirectly connected with the cavity of the hock-joint, with which this has no connexion whatever. It also differs from those affections in being generally productive of lameness. From curb, its situation will at once distinguish it.

ITS TREATMENT will consist in a high-heeled shoe being applied ; and in using fomentation and stimulant lotions ; with the aid of cathartic medicine and rest. As soon, however, as the inflammatory symptoms have abated, even though lameness may have disappeared, it will be advisable to blister the part before returning the horse to his work.

#### SPRAIN OF THE TENDON OF THE FLEXOR METACARPI EXTERNUS.

Now and then this accident occurs. It consists in an oblong windgall-like tumour, making its appearance upon the outer side of the arm, immediately above the knee, taking the course of the tendon above-named, and consisting, evidently, in distension of the sheath of that tendon, from an accumulation of fluid within it. Some extraordinary and unprepared-for exertion has caused lesion or strain of the parts ; the fibres of the delicate cellular tissue uniting the tendon with its sheath, or, may be, those of the sheath itself, have sustained strain or laceration, and the result has been effusion into the cavity of the sheath. On its first occurrence, the horse commonly goes lame from the sprain, though the lameness may be but slight. After a short time, however, under any ordinary treatment, the lameness usually disappears : the tumour still remaining ; without causing any pain, however, or even inconvenience to the animal in action.

#### SPRAIN OF THE TENDON OF THE FLEXOR METATARSI.

THIS being rather an unusual accident, and, when it does

occur, a serious one, and happening to have lately had an excellent case of it, I prefer giving the particulars of the case as they stand in my "Records" to offering any general observations on its nature.

On the 9th May, 1846, a troop horse returned to Hyde Park Barracks from Putney Heath, after performing his part in a field-day there, lame in one hind leg. At the time, the lameness seemed to arise from sprain of the fetlock joint; next day, however, the cause manifested itself to be sprain of the sheath of the tendon of the flexor metatarsi, at least of that division of the tendon which crosses over the bend of the hock from the outer to the inner side to be inserted into the head of the internal metatarsal bone. There had arisen a puffy elastic swelling upon the part, hot to the feel, and so tender to the least pressure, that the horse caught his leg up every time it was touched with the hand, and was very averse to having it squeezed or compressed.

THE TREATMENT pursued consisted in fomentation and physic, and bandaging as far as was, in a part so inconveniently situated, possible; avoiding putting on a thick or high-heeled shoe, since this would have put the muscle affected on the stretch instead of relaxing it. In such a case the heel cannot be too much lowered, and therefore a tip would be preferable to even a plain shoe. Eight days after his admission the horse was rendered sound, and returned to his duty. Five weeks afterwards, however, he became lame again, and was then blistered; and as soon as the first blister had worked off, the lameness, though abated, continuing, he was blistered a second time; and after that, a third time, before soundness in the action of the limb was perfectly restored. There remained afterwards, as might have been anticipated, solid tumefaction in the nerve of the tendon, which, though in time action might diminish, seemed likely in some degree to be permanent. There is more than the usual quantity of cellular tissue connected with this tendon in its sheath, and this will account for the unusual degree of inflammation accompanying the lesion, as well as for the solid deposit which commonly ensues.

## SPRAIN OF THE FLEXOR TENDONS.

*(Clap of the Back Sinews.)*

So prominent in the minds of horse persons stands this accident beyond all others, that when a horse is said to be "sprained," without any question being asked, the "back sinews," it is taken for granted, is the seat of injury; and those of the *fore* leg in particular. Out of two facts like these two questions naturally arise:—one is, what is the reason why the flexor tendons fail so much more frequently than others?—another, why those of the fore limb should fail rather than the flexor tendons of the hind leg?

I have more than once had occasion to direct attention to the important functions performed by the hind limbs in the acts of progression, and to contrast these with the comparatively light duties of the fore limbs. While one, like a pair of oars at work in a boat, are plying forwards and backwards, forcing the body onward; the other, more like stilts, are employed in sustaining the propelled parts, lest the body fall forward to the ground. I have likewise afore observed, that two such different functions necessarily distress different parts of the limbs; the hock being the part most exerted in the hind, the feet and legs the parts most tried in the fore limbs. What distresses the sinews of the fore limbs so much is the extreme distension, almost preternatural, to which these legs are put in hard galloping and leaping every time the weight of the body descends upon them, at the moment they are stretched out to their uttermost, as they must be, to receive it; and it is in this identical position of limb, whenever any weight or force of extraordinary amount, or in any sudden or unexpected manner, descends upon it, that *strain* or *sprain* is produced.

To CAUSES, therefore, which put the sinews to such trials of their strength and tenacity are we to look for illustration. Hunters and racers, and steeplechase horses, and such like, are the especial subjects of sprained legs. Horses ridden on the road, or as hackneys, are oftener lame from foot disease. Military horses are more frequently lamed in their feet than in their legs; though this again depends much on the exercises

—or the paces at such exercises—to which the regiment they belong happens to be put. Harness-horses experience sprains in their hind legs, in their fetlock-joints in particular, they being the parts more exerted in draft. It is possible that thin-heeled shoes, by letting the heels down suddenly, may have some such effect ; though I cannot say I have witnessed it.

But sprain may be produced in another way. The muscles to which the tendons belong may be called into such forcible or sudden action as to occasion it. Going at a tearing pace through deep ground is very likely, through excessive muscular action, to sprain the tendons. Setting his foot accidentally in a rabbit hole, a horse instinctively makes a sudden effort to disengage himself, and in that act is not unlikely to sprain his sinews. Should the foot happen to be set awry, or to slip on one side, a joint is more likely to be sprained than a tendon.

THE SYMPTOMS OF SPRAIN OF THE BACK SINEWS are in general unmistakeable ; though this will depend on the severity of disease with which, or period of time at which, the horse may come to be examined. Severe sprains will develop themselves early ; sometimes as soon as done : slight sprains, on the other hand, may require several hours, and even days, to do so. This is another example, among many existing similar ones, to show the imprudence of hasty opinions in cases of lameness. The horse, we will say, is lame : lameness being the usual accompaniment of sprain. The hand is passed down the lame leg ; and swelling and heat is felt, and the horse flinches as our thumb and finger grasp the swollen part. The swelling may consist only in a small, soft, puffy tumour or “knot,” as grooms call it ; or it may be diffuse and extensive. The pain will be much greater in some cases than in others. The horse frequently stands with his lame foot flexed, reposing upon the toe to ease his sinews ; and now and then will, in trotting, “drop” considerably upon the sound limb : in other (slighter) cases, the lameness will be but trifling. In very severe sprains the local inflammation and pain, on occasions, are so intense, that the system even sympathises with the suffering limb, and symptomatic fever is the consequence.

THE PARTS SPRAINED are naturally supposed to be “the sinews.” But sinews or tendons being tissues both inelastic

and (per physical force) inextensible, they, themselves, can neither be stretched nor strained, so long as they maintain their cohesion of substance. To discover, therefore, in what part the sprain or lesion is likely to be situate, it will be advisable to submit the leg in its normal state to anatomical examination.

If we strip or dissect off the skin from the flexor tendons, we find, underneath, between them and the skin, a quantity of loose cellular tissue; cutting away which we come to a close or proper tunic of the same substance immediately enveloping the tendons. This under or proper covering, however, is fibrous as well as cellular in composition. For the space of a hand's breadth below the knee, the glistening (tendinous) fibres may be seen crossing obliquely over the tendons, as they run from the annular ligament of the knee to be implanted into the external border of the cannon bone, behind the external splint bone. This forms the sheath of the tendons. And when we slit it open, we discover a cavity possessing a surface of a synovial nature; and a sac or *bursa* thereby formed, which extends half way down the leg, and is there closed. Through the bursa runs the perforans tendon, which may indeed be said to form a posterior boundary to it. The interval between the flexor tendons and the suspensory ligament, in their front, is likewise filled with inter-uniting cellular substance. This brief and imperfect anatomical sketch may serve to illustrate the

NATURE OF SPRAIN. It will at once strike us, that, although the tendons themselves are incapable of extension, and are too firm and strong in their texture to sustain hurt from any common accident, yet that they are surrounded, and connected together, as well as to the parts contiguous to them, by a soft delicate tissue which must, every time they are forcibly pulled or stretched, be extremely liable to stretch and laceration; and this, in fact, it is, which, in all ordinary cases, constitutes the true and sole nature of "sprain of the back sinews." Coleman defined such a sprain to be "an inflammation of the *cellular tissue* connecting the perforatus and perforans tendons together;" and this was taking a fair general view of its nature. To enter into particulars, we shall first have to notice the puffy swelling or *knot*, mentioned before, as being discover-



able in the course of the tendons, about the middle of the leg ; the pathology of which is, that effusion of fluid has taken place into the sac or bursal cavity but lately described as existing within the sheath of the flexor tendons : the effusion being, as it would appear, different at one stage—or, rather, under one form of disease—from what it is under another. Suppose, for example, the swelling, as it does in some severe forms of sprain, *immediately* follows the accident ; we cannot, in this case, imagine it can consist of anything else but blood poured out from ruptured vessels ; on the other hand, supposing, as in the ordinary case, some time intervene between the sustaining of the injury and the appearance of the tumour, we take it for granted that the effusion is of the usual sero-synovial character, gravitating to the bottom of the sac. Frequently, in slight sprains, it is not until the day following that on which the accident happened that any swelling is discoverable. I will relate a case to illustrate this.

*Sept. 4th, 1848.* One of the horses composing the Queen's Guard, after having walked perfectly soundly to the Horse Guards on the day before, in turning out to return to Hyde Park Barracks, was found to be so lame that, at the moment, it was thought he was seized with the "cramp." Nevertheless, he was brought to the Barracks, and there shown to me. By that time he was so far recovered that he walked sound, but still evinced lameness in the trot. On examination, I discovered, a little below the back of the knee, on the inner side of the leg, a puffy tumour extending half way down ; not particularly tender to pressure, nor hot to the feel ; and yet the sole apparent cause of the existing lameness. It manifestly consisted of an accumulation of fluid within the sheath of the flexor tendons ; the rationale of the case in my mind being, that the horse had sprained his leg in going on guard the day before.

The above is what usually happens. But it is possible a sprain may not evince any signs of its presence for two or three days afterwards. A horse in the Regent's Park Barracks was admitted into the Infirmary for "lameness," the seat of which, in the absence of any external sign, it was conjectured at the time might be in the foot. On the fourth day after

his admission, he not having stirred out of his stall during the interval, sprain of the flexor tendons patently showed itself.

On the other hand, in severe cases, the sprain may declare itself even at the moment of the accident. My regiment was out exercising on Wormwood Scrubs. A charge was made across the ground. The horses were no sooner pulled up than one was found "dead lame." My assistant was instantly called to the spot, and found a "lump" upon the flexor tendon, above the middle of the leg, which convinced him the horse was sprained; or, as by those around, it was called "broke down." In this case *blood* must have become extravasated.

The bursal tumour may, then, be regarded as the simplest form of lesion from sprain. Beyond this, there may be similar effusions, producing "knots," in the lower division of the sheath; or there may be sero-albuminous effusion, generally, into the cellular tissue investing the tendons, filling up the intervals between them, and giving the leg that aspect and feel which is denominated "round." This interstitial deposit is soft and compressible while recent; but, in the course of time, becomes of more solid and firm character; until, in the end, unless absorbed, it turns to consolidation of parts, and thickening of the skin covering them, assuming after a time that hard callous nature that renders the enlargement irremovable, or but very partially absorbable. But this may be regarded rather as a result of

#### SEVERE SPRAIN OR "BROKEN DOWN,"

As it is called, than of the *slight* form of injury. The phrase "broken down" would seem to imply there was something *broken* or ruptured. Pathological research, however, has failed to confirm any such popular delusion. In his rapid course—in the race, in the hunt, or, as was mentioned before, in the charge—the horse fails all at once, i. e. *breaks down*: he comes to a stand, with the ailing leg held up in the air or rested upon the toe, and can hardly manage to limp off the ground. Everybody around is impressed with the notion that the animal has "broken his leg." He is denounced as

“broke down,” and ruined, and fit for nothing but to be shot ! All this has led to a good deal of misconception concerning

THE NATURE OF “BROKE DOWN.” That distinguished surgeon, the late Mr. Liston, writing in his “Elements of Surgery” on the subject of RUPTURE OF TENDON—which does now and then happen in human practice—says, “such injury *often* happens to horses in what is called ‘breaking down.’ In them the tendon is occasionally *snapped actually through*, and the ends widely separated.” Veterinary surgery, however, fails to confirm this. Coleman viewed “broke down” as sprain or rupture of the *suspensory ligament*. Blaine says the same thing, admitting rupture of the flexor tendons to be “very rare.” Spooner, in his edition of White, says, “This accident (breaking down) is *supposed* to depend upon a rupture of the great suspensory ligament of the leg ; though sometimes it is occasioned by a rupture of the ligaments of the pastern.” And, further on—“I have met with two cases of rupture of the ligaments by which the two pastern bones are held together. It happened to two *nerved* horses. *Both came down upon the fetlock joints* ; and were on that account shot.” And nothing short of actually “coming down (to the ground) upon the fetlock joints” ought, in my opinion, to be allowed to constitute *break down*. However severe the sprain, and however lame and helpless the horse in consequence of it, still, no *break down* can or ought to be pronounced to exist in the absence of complete rupture ; an accident of which we appear to have no instances on record as respects flexor tendon, and but few as respect ligaments. Nor are we to feel surprise at this, seeing that the tendon oftenest broken in man (*the gastrocnemius*) has, in comparison to size of animal, so much larger and more powerful muscles attached to it than have the perforans and perforatus tendons in the horse.

THE EFFECTS OF A RUPTURED TENDON OR LIGAMENT are at once shown by the following experiment—one that was made some years ago by myself on a young ass about to be sacrificed for the purpose of dissection. By means of a bistoury introduced into the leg between the flexor tendons and suspensory ligament, both the tendons were divided, first in one leg, then in the other. The heels of both fore hoofs immediately came

more completely down upon the ground, so that the animal in walking—which he still did with tolerable freedom—seemed as though he was suffering from fever in the feet. Afterwards, the suspensory ligaments of both legs were cut through. Immediately, the animal was let down upon his fetlocks, walking twenty or thirty yards without any great risk of falling, unless when hurried out of the walk; although at the time he went, actually bearing—instead of upon his hoofs, which were now inflected upwards by the unopposed action of the extensor muscles—upon the tufts of hair growing from his fetlocks: the pasterns the while being bent down upon a level with the ground.

IN SEVERE SPRAIN, however, although there is no absolute rend asunder of tendon, there exists, owing to the violence that has been used, sad lesion to various tissues. The cellular and fibrous sheaths, attachments, and envelopes are, no doubt, much stretched beyond their powers, in places, in fact, lacerated. Nor have we any right to suppose that either tendons or ligaments come off unscathed; but that, on the contrary, fibres of one or both, in places, from forcible efforts of extension, occasionally yield and give way, and thus add materially to the complication of the injury inflicted. After all, however, that can be said by way of pathological exposition, much must be left to conjecture. One thing is certain; and that is, that violent inflammation follows so severe an accident, in the train of which come swelling and heat, pain, tenderness and excessive lameness. The horse literally hops upon his flexed limb, not daring to impose a fraction of weight upon it, nor suffering it to be extended or even handled, ever so gingerly. The effusion which has taken place, by the third or fourth day after the accident, is so great that the limb is swollen from knee to fetlock, even down to foot, and in some cases upward as well; the tendency of such tumefaction being to run on to the permanent agglutination of parts together into one solid mass; and through the changes from softness to hardness, from hardness to callus and thickening, and even scirrhus, to render such unnatural union permanent and irremediable: causing in this manner roundness and hardness of leg, and stiffness, if not actual lameness, in action, for the rest of the animal's days.

IN OLD HORSES WHO HAVE DONE MUCH WORK, such likewise is the case. Their fore legs are "round," and feel firm and skin-bound; they having been brought into such condition either from experiencing sundry repetitions of sprain, or from excessive or long-endured work; the inflammatory or increased vascular action induced by which tends, in the course of time, to the same consequences. These are what are called *gummy* or *bumped* legs. Nor with such legs is it often that the fetlock joints do not partake of this roundness or solidity and skin-tightness; though the firm adhesion and close sitting of the skin is to be viewed often, rather, as the effect of stimulating treatment—blistering and firing—than of disease. All which remote and final consequences of inflammation in such parts, when once established, are entirely without the pale of ordinary remedy; requiring, if remediable at all, another and totally different class of therapeutic measures. Therefore will

THE TREATMENT OF SPRAIN consist of simple means, or comprise remedies of a higher class, according as the sprain is slight or severe, recent or of long standing. In most diseases of the muscles or their tendons, it is a primary consideration to put them, as organs of motion, into a state of repose. This is effected in two ways:—by putting them into a condition of relaxation, by bringing their points of attachment as near together as possible; and by absolute rest. In the present instance our object will be attained by a thick-heeled shoe, or a shoe raised at the heels by calkings, according to the requirements of the case. Trifling as this may appear to some, it tends very much to the relief of the animal whenever his leg is in pain, besides contributing to aid other remedies in bringing about restoration.

FOMENTATION of the leg, which is more effectual than the warm bath, is by far the best topical remedy for a recent and painful sprain. It soothes and softens pain, while it abates inflammation and relaxes the parts it is seated in. One of the best modes of using fomentation is through the medium of the spongio-piline. Cut two pieces, each large enough to wrap round the leg, and long enough to reach from the knee to the fetlock, and fold either piece in succession round the affected part, letting the other soak the while in hot water.



The water should be as hot as a man can bear to immerse his hand in, and that temperature ought to be maintained. One of the pieces of spongio-piline may remain bound, by a common bandage over it, upon the leg during the night: it will act as a poultice; and being fresh applied the last thing at night, and renewed the first thing in the morning, there will be no fear of its growing dry. During the inflammatory and painful stage of sprain I do not approve of *cold* applications.

A FULL DOSE OF CATHARTIC MEDICINE will materially aid our local treatment; and

DRAWING BLOOD FROM THE ARM OR TOE OF THE FOOT will, when inflammation runs high, prove one of the most direct subduers of it we can have recourse to. Supposing it does not materially inconvenience or pain the animal to have the shoe removed, I prefer, myself, abstraction of blood from the foot, as telling more directly on the congested parts. In a slight sprain, blood-letting is hardly called for.

COLD APPLICATIONS will be found preferable to warm ones, as soon as the heat and tenderness have quitted or become much abated in the sprained parts. After the relaxing effects of the fomentation, they will brace the parts—act as a tonic to them; and at the same time tend to extract any remuants there may still be of inflammatory action. Various kinds of evaporating and cooling and sedative embrocations are used for this purpose; though I am not quite certain that any of them exceed much, if anything, in efficacy, simple cold water, providing the water *be* cold, and the bandage\* wetted with it be re-dipped often enough to maintain its low temperature. For those who think otherwise, however, I subjoin a couple of formulæ:—

℞ Ammoniæ Hydrochlorat. ʒij;	℞ Ætheris Sulphuric.,
Aceti ..... ʒiv;	Sprts. Vini Rect., āā..... ʒij;
Aquæ..... ʒxij.	Tinct. Lavandulæ co..... ʒj;
M. fiat Embrocatio.	Aquæ ..... ʒxij.
	M. fiat Embrocatio.

As the tumefied parts grow cool, feel firmer, and bear pressure better, the bandage—which, to prove effectual, must be put on

\* Linen bandages for the legs should be made of Russia duck, and measure three yards in length and three and a half inches in breadth.

*secundum artem*—may be applied with more and more tightness ; pressure through such means being vastly conducive, not only to the bracing and strengthening of the parts, but to the promotion of absorption of any remaining deposits in the sprained tissues. In fact, continued repose—which may be gradually converted, first, into exercise in a loose box, and, subsequently, into walking exercise—with the unremitting application of the bandage, will be the best means we can adopt towards preparing the limb to once again sustain the animal's work.

THE TREATMENT FOR A SEVERE SPRAIN will, in its primary stage, differ more in degree than in kind from what I have been prescribing. In a violent case, the sooner after the accident the thick or high-heeled shoe can be put on the better : delay here is dangerous ; since in a short time the leg may become so swollen and painful as to render handling or flexion of it too distressing to be borne, while the shoe is taken off to be replaced by another ; a circumstance which will not fail to turn out a source of regret in the course of the treatment.

The fomentation will here require to be still more perseveringly laboured at. The dose of physic will require to be still stronger. And there will be no question about blood-letting ; and blood in this case had better, indeed must, be taken from the plat vein, the leg being too tender to endure the foot being lifted and handled. And a larger quantity of blood should be abstracted—such a quantity, indeed, as may be said, on the first occasion at least, to have some effect on the system. These several remedies must be repeated, time after time, and perseveringly persisted in, according to the progress of the case, and other circumstances which the judicious practitioner will not fail to note : the object being to subdue inflammatory action, and with that to allay suffering ; which latter, on occasions, for a time at least, becomes our leading consideration. We must not expect to accomplish this in a hurry. Great and extensive mischief has been inflicted ; tendons, ligaments, thecæ, bursæ, joints perhaps, are involved in it ; to the repairing of all which Nature must necessarily be allowed full and sufficient time. And even when all has been done that can be done, both by Nature and Art,

towards restoration, will much remain still to be accomplished, to which the action of the parts will require to be aroused afresh by another and quite a different class of remedies ; to wit,

BLISTERING AND FIRING.—Even in severe sprains, by the judicious application of the remedies recommended, and perseverance in their use for a sufficient length of time, soundness in very many cases is to be restored, providing the case be brought, so soon as it shall happen, under treatment, and providing it be not one of relapse or renewal of an old sprain. Inflammation nearly or quite abstracted, the leg becomes cooled down almost to its natural temperature ; and although a good deal of thickening in places remains, and the skin covering the enlargements has an unnatural closeness and tensity—arising from adhesions existing between it and the parts underneath, through unabsorbed interstitial deposit—yet do the tendons perhaps play, or may from use after a time do so, with sufficient facility to enable the horse to walk and even trot soundly upon his still anormal limb. On the other hand, stiffness may remain very observable in action ; or lameness, though much relieved from what it has been, may still continue, and appear to be permanent ; rendering the animal, unless more can be done for him, unserviceable to his possessor, and a source of plaint against his veterinary attendant. Under these circumstances, blistering or firing comes to be considered. Nay, even under circumstances wherein there is no lameness—wherein soundness has been restored, the horse must not be permitted to return to work without these potent therapeutic and surgical aids being called in, would we desire to preserve our patient in soundness, and especially under severe or trying work, against the liability, I might almost say *certainly*, of return of lameness. There is no disease that I know of so likely to relapse under fresh excitements as sprain. Even horses with slight sprains require intervals of rest, and after they have been “cured” too, before they can be safely taken again into work ; and in severe cases, no veterinarian or hunting man would think of a horse *standing* any violent work, at least—such as hunting, racing, &c.—without having “had the iron.” Firing, here, is the remedy, and the only remedy

to be relied upon. Blisters may answer in certain cases of first sprain, and that not of the worst character, and where the subject of it is not likely to be called on in the capacity of hunter, racer, steeple-chaser, &c.; but the firing-iron, and *nothing short of it*, painful though it be to the feelings of the operator, and torturing to those of the operated on, is, I feel regret at being obliged to affirm, the sole means we have at present at command to save the "broken down" horse from the slaughter-house. By the firing-iron, have horses, originally worth their hundreds of pounds sterling, been raised from knacker's price to their former value. By the iron, has many a broken-down hunter, and many a racer, been joyously restored to his station and rank in the field where his proudest laurels have been won.

#### SPRAIN OF THE SUSPENSORY LIGAMENT.

THE "SUSPENSORY LIGAMENT," as it is called, is one of those peculiar structures which are introduced into particular parts of the animal body as aids to muscles, by sustaining weight in a state of inaction, and counter-acting concussion at the time of action, by virtue of the property they possess of *elasticity*. This property enables them to act after the manner of springs. When weight to a given amount comes to be thrown upon them, they yield and elongate, and when it comes to be removed, they contract and shorten; and all through virtue of their elasticity. It is not to be wondered at that textures like these should be occasionally out of order; indeed, our only matter of surprise is, considering how they are used and tried, that, as antagonists, as well as aids to muscle, they are not much oftener out of order than they prove to be. The suspensory spring, whose disorders we are about to consider, is one of the most important, if not the most important, of this class in the horse's body. It is of great length, and very elastic, and patently exhibits to our view, when in operation, its beautiful action and counter-action. Gallop or canter an Arabian or Spanish horse, or any well-bred horse of our own country who happens to possess long and oblique pasterns, and the fetlocks may be observed at every successive stride, owing to the force of action, descending to the ground and

receding again the moment the feet are lifted and the weight removed ; thus playing up and down, through the operation of their suspensory springs, with most admirable effect in counter-acting concussion, and so not only relieving the animal machine of all shake and shock, but conveying to the rider upon it the most easy and pleasurable sensations. Should more weight be thrown upon this spring than it is able to bear, or should weight descend suddenly and unexpectedly upon it at a time when such muscles as act in concert with it are unprepared to co-operate, then will it be liable to be sprained or to sustain rupture or laceration of some of its connexions or fibres : indeed, it is said, that under such circumstances its entire substance may be ruptured—actually torn asunder ; though our records are very barren proofs of such accidents.

THE CAUSES OF SPRAIN OF THE SUSPENSORY LIGAMENT will be—injurious stress imposed upon it either through great burthen upon the animal's back ; through the hard pace the horse is made to go at ; through high leaps or jumps off steep descents ; through compelling the animal to tread with unnatural force upon his heels, by cutting away in shoeing the heels of the hoof, or putting on his feet thin-heeled shoes when he has been accustomed to thick-heeled ones. Of these several causes, however, it is the muscular efforts he puts forth, at a time when he is made to strain every sinew either in the hunting field or in the hard contested race, that mostly occasion the mischief. All at once the suspensory spring “cracks,” *i. e.* gives way, and the horse is said to be “broken down.”

THE PATHOLOGICAL NATURE OF SPRAIN OF THE SUSPENSORY LIGAMENT is but rarely susceptible of demonstration. Unlike ligaments proper, which from the uses they serve are necessarily made *inelastic*, this being an elastic tissue, is capable of being over-stretched or “sprained” without necessarily sustaining laceration or rupture of fibre ; though, as was observed before, laceration either of its own fibre or of that of the cellular tissue composing its sheath appears extremely likely, in most instances, to take place. It is possible, the ligament may be partially torn from its attachment to the head of the cannon-bone ; or the muscular fibres, entering about here into its composition, may be strained or torn through ; or its sheath



may be the seat of injury, which is probably the case whenever the disease appears located about the middle of the leg, between the knee and fetlock. Again, the seat of lesion may be lower down the leg, at the places of implantation of the bifurcations of the ligament into the sesamoid bones, and the large bursæ mucosæ here placed, between the ligament and the back of the fetlock joint, may become distended and enlarged. But, in such a complex part as the fetlock joint and its appurtenances, it is extremely difficult to say whereabouts the precise seat of lesion is, and what parts in particular are suffering. What, however, most of all tends to confuse us in seeking for the seat and nature of disease in cases of "sprain of the suspensory ligaments" is the fact of such sprain but rarely occurring unattended by lesion of other parts; in particular, of the flexor tendons and fetlock joint. And the consequent general tumefaction of leg, arising so soon as it does in such cases after the accident, but too often confounds all attempts at diagnosis.

#### SPRAIN OF THE FETLOCK JOINT.

THE joint of the fetlock, which is one of more than usual complexity of structure, occupies that peculiar situation in the limb in which weight does not operate perpendicularly upon it only, as it does upon the knee, but presses in two directions, obliquely forward as well as directly downward. That portion of the weight which tends directly downwards is received by the sesamoid bones, and these bones are sustained by the suspensory ligament; we need, therefore, feel no surprise that derangement of the ligament should be a frequent concomitant of disorder of the joint. And not of suspensory ligament only, but of flexor tendons, and on occasions of extensor tendon as well; for such is the structure of this joint, that to these tendons and ligament is mainly owing its great strength and unusual powers of flexibility and elasticity. Upon the action of the sesamoid division of the fetlock joint depends the action of the suspensory ligament. If the sesamoid bones become fixtures, the suspensory becomes useless; or, supposing the suspensory to be deprived of action, the fetlock would lose its spring-like play while the horse was going: thus, either struc-

ture may suffer deprivation of function and consequent derangement from disease of the other.

Owing to this duplicate structure and function of the fetlock, there may be said to be

^ TWO KINDS OF SPRAIN OF THIS JOINT AND ITS APPURTENANCES: one in which the tendons are the parts mainly involved; the other, in which the posterior, sesamoid, and suspensory division suffer the most: the former occurring more in the fore legs; the latter in the hind. When a horse is sprained in the fore fetlock, we frequently find the swelling and heat more in the anterior parts than in the posterior; very often, indeed, there exists fulness in the site of the extensor tendon, as well as around the joint, giving the horse the appearance of "knuckling over." On the other hand, when the hind fetlock has sustained sprain, we usually perceive that the posterior parts of the joint are swollen and heated, to the entire absence of anything similar upon the front parts. This arises from the difference in function—in progression—between the fore and hind extremities; on which, as I have so lately written,\* I shall not here offer further explanation. In what are called "sprains of the fetlock *joint*," it is not often that there exists any lesion or disease of the joint itself. Mostly, when the swelling is in front, the *bursa* interposed between the extensor tendon and joint of the fetlock has become dropsical from distention; and when behind, that large bursa or sheath in which the flexor tendons run, as well as a smaller bursal cavity situate between the tendons themselves, is the seat of effusion; accompanying which there is commonly distention of the bursæ higher up, the same as constitutes *windgall*. The sheath in which the flexor tendons run at this part is of a more joint-like construction than sheaths in general; the concave interspace between the sesamoid bones at the back of the fetlock joint being lined with a cartilaginous substance, having all the glossy smoothness of articular cartilage, and covered the same with synovial membrane. Structure like this renders a sprain of much greater import here than in an ordinary tendinous sheath, caused, as in the case in front, by the inflammation to which the sprain has given rise, spreading from

\* Turn back to p. 346.

cellular tissue—in which it commonly has its origin—to bursal and other contiguous structures. Further than this general description goes, it is extremely difficult, if not impossible, to define what parts, in a joint made up of so many as the fetlock is, are most or especially diseased, and in what disease in its several stages precisely consists. Every opportunity afforded for dissection of the parts in a state of lesion or disease must necessarily enlarge our knowledge of this department of pathology; but, unfortunately, opportunity comes too rarely to make our advancement of the kind so great or so rapid as could be desired.

THE TREATMENT proper for this sprain will be best learnt by the study of that which I have recommended for “sprain of the flexor tendons;” it being borne in mind that, in respect to the high or thick heeled shoe, such must not be used in any case where the anterior parts of the fetlock are the seats of disease—as in the fore leg—rather than the posterior. I would also remark that, though soundness come to be restored by the use of fomentations and embrocations and bandages, and, if requisite, of blood-letting from the toe of the foot, it is but seldom that such soundness can be regarded as permanently to be relied upon. In general, fetlock lamenesses, to guard against the recurrence of them, have, at the conclusion of their primary treatment, to undergo blistering or firing. Now and then, the tartarized antimony ointment, or the ointment of the deuto-ioduret of mercury, may be employed, instead of blistering or firing, successfully. Though but small, if any, advantage, in point of time, is to be obtained by either of these substitutes; since either ointment used as repeatedly as requisite will cause the hair and cuticle to come off, and thus the time their operation requires to produce full effect will not be much less than a blister would occupy.

The following observations, penned many years ago by Professor Dick, of the Edinburgh Veterinary School, did not meet my eye in time for insertion in their proper place:—“It is generally considered as an established pathological fact, that, in those injuries, commonly designated strains of tendons, *the injury is confined to the sheaths*, and that the tendons themselves are not the seat of injury. This, at least, is, I believe,

the general opinion of veterinarians, and is the doctrine taught by veterinary writers. I am inclined, however, to take a different view of these injuries: and I am bold enough to assert, on the ground of pathological investigation, that, in such cases, the injuries are sustained in the tendons themselves, while the effect produced in the sheath or cellular membrane by which they are surrounded, is only an extension of the inflammation, consequent upon the injury, to the more important parts. In support of this assertion, I may observe, that I have known tendons partially and wholly ruptured, blood effused, lymph organised, and osseous matter deposited in and on them. I have seen all these occur where the tendon passed under the navicular bone. I have also found them in other parts of tendons. The obdurate and painful enlargement of the bursa at the fetlock, which leaves, generally, a permanent thickening, also arises from such injury.”—*Quarterly Journal of Agriculture, Edinburgh*, vol. ii, 1829-31.

#### TENOTOMY.

##### (*Division of the Flexor Tendons.*)

DEFINITION.—To say nothing of the valuable elucidations human anatomy and physiology have from time to time received from the investigation of the structures of different animals, and the varieties in their general economy, we may take occasion to remark here, that the operation we are about to take into our consideration appears to be of purely veterinary origin and growth, and that for any utility it may have turned out to be to the surgeon, he stands debtor to the science and practice of the veterinary surgeon. So long ago as the time of Vegetius, horses were “said to be stiff-limbed,” suffering “from a contraction of the nerves (*tendons*) in their feet,” treading “with the tops of their hoofs,” having “their joints rigid and stiff,” unable to “set their hoofs full upon the ground.” And though since the age in which this father of veterinary medicine lived, “stiffness of limb” or “stiff legs” has found mention in works on farriery, with some ridiculous nostrum for their relaxation and relief, yet has the description, brief as it is, remained, in a practical view, un-

surpassed, and the ailment without a remedy, up to the time of the improvement which farriery in our own country underwent some few years anterior to the introduction of veterinary medicine as a science.

ALL THE HISTORY I am able to glean of the suggestion and practice of an operation which has proved—so far as remedy can be expected to turn out—of effective service in such distortion of limb, is to be found in the third volume of ‘The Veterinarian’ (for 1830). In a communication therein “Of the Edinburgh Veterinary School,” from the late Mr. Castley, at page 309, we read that “Mr. Dick’s (the present veterinary professor at Edinburgh’s) father occasionally practised this operation many years ago; and I (Mr. Castley) have heard it said, but I know not how far that may be correct, some other person in Scotland.”

The earliest intimation I had myself of the operation was, many years ago, through some articles on the subject in the ‘Sporting Magazine,’ by Professor Dick. I must confess, at the time, the operation, so purely mechanical, and so far unsurgical, as it appeared in my eyes, created in my mind anything but a favourable impression. In theory I felt myself decidedly opposed to it. Nor was it anything short of putting it with my own hand to the test that convinced me of its practicability, without its being followed by those unpropitious consequences which in my own imagination I had conjured up as so many drawbacks against such an operation.

Mentioning the subject, in May, 1833, to Mr. Cherry—the present Principal Veterinary Surgeon of the Army—it was resolved between us that the operation should be put to the test; and he having at the time a young ass in his possession, proposed that the animal should be subjected to an experiment which certainly entailed but little pain, and out of which benefit to science seemed likely to arise without the necessity of permanently laming or even of much disfiguring the animal. Accordingly, both flexor tendons of one fore leg were divided with a scalpel, and with them, unfortunately, owing to a struggle made at the instant, the metacarpal artery. The division at once let down the heel of the hoof more completely upon the ground, while the toe inclined to turn up; and when



the animal came to walk, the toe, no longer being employable as a fulcrum, every time the maimed limb had to move forward, the body sank down on that side as though it would have fallen to the ground had it not been for the instantaneous transfer of the weight upon the opposite (fore) leg. A compress was applied upon the leg to stanch the hæmorrhage; after which was effected, the animal was turned out to take its chance, without any bandage or application whatever to the incised leg. In this condition, under circumstances apparently little favourable to union, still did Nature's resources prove amply sufficient to heal up the wounded parts; and, in the course of time, to restore normal action: insomuch that Mr. Cherry kept the ass for its lifetime afterwards, using it for carrying his children, drawing a small water-cart, &c.

CONTRACTED SINEWS—which means *contracted muscles*—being the name given to the case for which TENOTOMY is performed, and it being, so far as this operation is concerned, an *unique* case, it will become my duty here to give some account of it. Of the two sets of muscles provided for the motions of the fore limb, one set, the *flexors*, bend the leg and foot; while the other set, the *extensors*, extend or straighten these parts: they are, consequently, antagonists in action. But the flexors are more numerous and powerful than the extensors. And owing to this superiority of power, there is a continual (natural) endeavour on the part of the flexor muscles to bend the leg, which they are only prevented from carrying into effect by the counter-action of the extensors, aided by the natural standing posture of the foot upon the ground. Whenever, however, this equilibrium of action comes to be destroyed, either through insufficient power in the extensors or excess of it in the flexors, or through the want of that co-operation which the ground affords so long as the foot continues placed upon it, the flexors draw the heel up and the toe down to that extent that the horse, on occasions, either treads upon the point of the toe exclusively, or absolutely stands and walks upon the fronts of his fetlock joints. In such a condition as this, it is manifest, the animal is rendered useless. Nor do I know of anything that can save him from slaughter except the operation now under our notice. I shall give a case in illus-

tration, and it is the earliest case of the kind I find recorded in 'The Veterinarian.'

Mr. Wells, of Wymondham, in June, 1828, was consulted about a horse that had been lame and useless for three years from a "sprain" of the tendon of the off hind leg. He had been blistered and fired, and blistered again, without obtaining relief. The foot was now drawn up by the permanent contraction of the flexor muscles to that extent that the front of the fetlock came down upon the ground at every step, impeding action so greatly that "the horse had been nine hours in coming a distance of seven miles." The flexor tendon was divided midway between the hock and fetlock, and at the same time neurotomy was performed, the last being deemed requisite to restore the action of the navicular joint. In two months afterwards, the horse, free from pain and lameness, was put to plough, where he was at work at the time this account was written, which was nine months afterwards.\*

But "contracted sinews" giving rise to so much deformity that the horse is thereby rendered unfit for use, may arise from natural causes, independent of any work or medical treatment the animal may have been subjected to. In October, 1837, was purchased a colt (gelding) for the First Life Guards, of a long-legged and growing character, who, originally ill-formed in his fetlocks, after purchase grew for several months so rapidly that his fore legs, becoming weaker and weaker, at length failing to sustain the weight of his body, gave way under it, becoming what is called "bowed" to that degree that the knuckling over was day by day bringing the fronts of the fetlocks nearer and nearer to the ground. I proposed the operation of tenotomy, which was performed by myself at Windsor in July or August—I forget which—in 1838. Within a month afterwards the horse walked to London. He was kept four months after this, in the course of which his legs became much less bowed, and he acquired strength in standing and walking upon them. It being evident, however, that there was no prospect, young as he was, of his ever recovering strength sufficient to carry a life-guards-

\* This case will be found at length in the second volume of 'The Veterinarian,' p. 142.

man, he was cast and sold, being then but in his third year. What became of him afterwards I lost all means of ascertaining. In this instance we cannot call the success more than partial. I shall next transcribe, from the seventh volume of 'The Veterinarian,' a well-narrated case of unsuccessful result; one that will serve to put us on our guard against harbouring vain hopes ourselves, and holding out too flattering prospects to others.

Mr. J. Holford, V.S., Middlewich, was applied to concerning a valuable horse, nine years old, who from a kick upon the off hind leg received two years before, for which he had been blistered repeatedly and once fired, had come to work gradually worse upon the limb, until at last he came to walk upon the point of his toe. His owner had been told that the heel might be brought down upon the ground again through an operation, and it was on this account that Mr. Holford was consulted. He accordingly operated. In six weeks afterwards the patient was in a state to be turned to grass, "without much perceptible lameness." In three months he showed no lameness, placing his heel down "apparently with as much facility as the other." Another month's grace was given him, and he was then put to work (which was drawing a fly-boat along a canal), but had not proceeded eight miles before he began to walk lame. The owner sent him home greatly disappointed, and gave him six weeks' longer rest. He was again taken to work, but not allowed to do more than half what other horses did. For two months he kept up at it; then, once more walked upon his toe, though "not so much as before." At the time of this report of his case he is, with a lever shoe upon his foot, turned out for a winter's run, not worth £10; "whereas, had he done well, three times that amount would not have bought him."

In the same (the seventh) volume of 'The Veterinarian,' several cases are given by Mr. Young, V.S., of Muirhead, Garnkirk, N. B. In one horse, whose off fore leg was much thickened, had been fired, and was so much contracted that "he could put the tip of the toe only to the ground," he "cut the leg," as the operation is there called; and the result was, although under unfavourable circumstances from the distance the patient was at, that "at the end of nine weeks he was

drawing a cart." The leg remained "thick," but was "straight," and the foot treads "in the natural position." "The owner said he was as strong on the cut leg as on the other."

These cases will be sufficient to show the variable success, depending on circumstances, sometimes apparent, sometimes unforeseen and unavoidable, attending the operation. I will now produce a case in illustration of an incidental mishap which all undertakers of this bold operation must calculate beforehand the probabilities or improbabilities of meeting with; and I do this in order that practitioners may in their minds be prepared for such-like unwelcome occurrences and results.

Mr. Goodenough, V.S., Driffeld, divided the flexor tendons for "contraction" in the usual way. But, after he had so done, he found he could not force the bent leg back into its straight or proper position.\* He fastened halters to the refractory limb, and employed four men to exert their strength in its extension. At the moment of their utmost efforts "a loud crack was heard," which frightened the men and surprised the operator. A few days were allowed to pass, when, no hopes whatever appearing of recovery, the horse was destroyed. It was found that the sesamoid bones had contracted adhesions to the metacarpal bone, and that these (adhesions) had sustained the force used for extension, while the sesamoids had become thereby fractured in twain.

THE OPERATION OF TENOTOMY, though a formidable one for the patient, is not a difficult one for the operator. The object consists in section of the flexor tendons; the effect of which, as we have seen, is to let down the heel of the foot (not the fetlock) to the ground. The flexor tendons, aided by the metacarpal ligament, support the pastern and foot joints principally; the fetlock joint having the additional strong support of the suspensory ligament, which it still retains after the tendons have been cut through. This accounts for the heel of the foot, without the fetlock, being let down by the operation of tenotomy.

Having cast the horse, and so secured the limb to be operated on that there is not much chance of any interruption

\* This, it is possible, might have been owing to the *metacarpal ligament* being left undivided.

being occasioned through its motion, a longitudinal incision, about an inch in length, is made on the inner side, along the course of the flexor tendons, midway between the knee and fetlock; though I have myself commenced by an incision along the *back* of the leg, opposite to the middle portion of the flexor perforatus tendon. By this free incision, though not through the theca, the operator will be able to stretch the mouth of the wound he has made round to the inner side of the leg; in which stretched position the skin is to be held by an assistant, while the operator introduces the fore finger of his left hand to push back the blood-vessels and nerve (which run along the inner borders of the tendons) against the suspensory ligament, so that they be safe out of the way, while with the right hand he insinuates his bistoury between them and the flexor tendons. Opposing, now, the cutting edge of the bistoury to the tendons themselves, he commences incising them by a steady but firm and strong sawing movement, until both be completely divided. I say, he is to hold the bistoury—which ought to be a stout one—firmly, and to use it with some force, since such is the dense and tough texture of these tendons that they are not cut completely through without some determination. Complete division being made of them, the heel of the foot still will not come down—should it happen, as I believe sometimes it does, that the *metacarpal ligament*, running in front of the tendo perforans—has not been included in the section. If it now be required, we may use such force as will make the limb straight, by stretching or even tearing through adhesions of moderate standing, so far as this can be effected without the risk of rupturing ligament or fracturing bone. The giving way of adhesions in such cases is frequently attended with a sort of snap or jerk, denotive of their being overcome, and by this the end is known to be answered: such adhesions and impediments to extension being commonly situate about or in the vicinity of the fetlock joint. The usual, but a dangerous, mode of accomplishing the extension, is to place the knee against the front of the fetlock, and, grasping the back of the foot with one hand and the upper end of the leg with the other, to use such steady and moderate force as will accomplish the object. This done, the divided ends of the tendons recede from each other,



leaving a gap between them of one or two inches, or even more, dependent upon circumstances.\*

THE TREATMENT AFTER THE OPERATION will consist more in watching the progress of healing than in anything that can be done to promote it any great deal. The external wound not being directly opposite to the internal one, will require nothing, save it be a suture or two at the time to prevent its gaping; and these will have to be withdrawn so soon as suppuration shall appear. A wet linen well-applied bandage will be requisite to give support to the leg. But the grand aim of the practitioner must be, to maintain, to the extent of his power, by such means as appear best calculated for the purpose, *the proper position of the limb*. It will not do to endeavour to effect this suddenly. To parts which for a length of time have become settled to, and seemingly have enjoyed, a false position, it will take time, and considerable time too, to restore a proper one. No force or violence must be employed to bring about this: it must be accomplished by degrees, and by humouring—if I may use such a word here—rather than by any sudden or harsh usage. In some cases the heel of the “cut” limb may for a short time at first require being kept raised, or it may not. On the other hand, after a time, the long-toed shoe may be called for, to force the animal to place his heel upon the ground, lest, after the healing takes place, the tendons become as contracted again as before the operation. During the healing season, inflammation of the limb will be kept within due bounds by the usual remedies.

THE SUCCESS OR NON-SUCCESS OF TENOTOMY will depend on a variety of circumstances, most of which will, on due reflection, prove to be within the control of the veterinary surgeon. Of course, the first, and indeed chief, consideration with him will be the fitness or non-fitness of the subject for such an operation. If he be called on to operate on a horse at every risk, in that case no responsibility can rest with him. On the other hand, when called on for an opinion, he will have to use both great judgment and great caution in giving one. Cases in which malposition is clearly owing to ankylosis, though it

\* Mr. Cooper in ‘The Veterinarian’ for June, 1850, suggests division of the metacarpal ligament only. How far this might answer the end desired I cannot at present say.

be but partial, of the fetlock or pastern or coffin-joint, are irremediable in this way. Neither can cases of contracted limbs of many years' standing, in aged horses, be undertaken with any great hopes of affording relief. Nor indeed should very young horses, whose limbs have become crooked from over-growth and weakness, be made the subjects; since their deformities, like those of children, admit very frequently of relief by other and simpler means, and with the accession of strength through aids of art appropriate for them, right themselves. Tenotomy may likewise fail of success from the operation being unskilfully or ineffectually performed. Or, the after-treatment may prove injudicious or even hurtful, frustrating the good which the operation would otherwise have certainly effected.

THE UTMOST WE CAN EXPECT FROM TENOTOMY is to render a horse useful for certain purposes, who, before the performance of the operation on him, was in a condition of utter uselessness. If we restore a cart-horse to the plough where the land makes his work comparatively light,—if we can make a used-up hunter serviceable for harrow or dung-cart;—if we can send horses, good for nothing in their present state, to work in fly-boats, road vans, brick or sand mills, &c., we most assuredly confer thereby, *quoad hoc*, good service on the public, to say nothing about the humanity of saving life whenever and wherever it may happen to be in jeopardy. As with neurotomy, we have had evidence of tenotomy being over-valued and misapplied. Each operation has its legitimate sphere of applicability and usefulness; to carry it beyond which is to bring it, undeservedly, into disrepute. Judiciously applied and skilfully performed, both operations will redound to the credit of their introducers—Professors Sewell and Dick—wheresoever, and so long soever, as the veterinary art is practised.

\*.\* Since the foregoing was in type, the following case has been kindly sent me by Mr. Cooper, Veterinary Surgeon at Berkhamstead:—"A draught mare received the common accident of sprain just below the knee, followed by enlargement of the part, the seat of which is frequently in that accessory ligamentous slip, by some called the *metacarpal ligament*, situated between the flexor tendons and suspensory ligament. The case was neglected, and the mare kept at work for several

months, until the leg became so crooked that she was quite incapacitated for any kind of labour. In this state she was sold for a trifling sum to Mr. Collier, of Chivery, near Wendover, and I operated upon her *above* the point where this ligamentous band is inserted into the tendon: such procedure giving me, in this instance, an opportunity of knowing the real seat of the affection. Having divided both tendons, I found the limb was still as rigid as before; and finding no other cause to account for such anomaly, I examined the metacarpal ligament, which I found considerably thickened. This I determined to divide; and the effect was, that the limb directly came into its proper position without any force at all being applied. The animal being released, and the direction of the limb attended to by the usual means, she was put to work at the proper time, and has continued to do well up to the present period, being nearly two years since she was operated upon. I am quite aware that I should have succeeded in bringing the limb into its normal position had I divided the tendon *below* the insertion of the metacarpal ligament; still, in cases where this ligament is the primary seat, I think a division of it alone, if resorted to in time, might suffice, without going to such an extreme as that of carrying the incision through the tendons."

And Mr. C. has since sent me the leg of an old dray horse, confirming this view of the disease: the metacarpal ligament being found much thickened and enlarged, with divers unnatural adhesions to the contiguous parts, altogether producing contraction or shortening of it, and, through it, of the flexor tendons. From the length of time the horse had been forced to tread upon his toe, it was curious to observe how Nature had provided him with a most extraordinary thickness of horn from the heels of the crust and frog, downward, which answered all the purpose to him of a shoe with high calkings. How far, in operating for tenotomy, it would be advisable to divide this ligament, so diseased, remains questionable.

#### LAMENESS ARISING FROM LACERATION OR RUPTURE OF MUSCULAR FIBRE.

According to our notions of the general or ordinary causes

of lesions of muscular fibre, if men are not infrequently the subjects of it, horses seem in our eyes to manifest double the liability. Muscle or flesh, I need not tell my reader, is the tissue in an animal body through which, by some incomprehensible *vis movendi* it derives from vitalization, all the motions of the body are performed ; its more obvious function being that of *locomotion*, or, in other words, enabling the animal to move from place to place. Nobody could possibly imagine, from seeing flesh hanging up in a butcher's shop, how wonderfully vitalisation alters its properties. While the fleshy fibre out of the body will rend or break with but comparatively little force or weight applied to it, the muscle or living fibre is capable of resisting force or weight to an enormous amount. It is not so much the amount of force or weight applied as the suddenness of its application, which, in the living body, is apt to be followed by rupture or rend of muscular fibre. A man feeling conscious in his own mind of any act he is about or likely to perform, prepares his will and his muscles accordingly ; and so, though the feat be great and trying, it rarely happens, unless through some unforeseen occurrence, that harm results. Now and then, however, it occurs that the mind and the muscles are taken by surprise, and then accident is very likely to follow ; as when a person, in descending a strange staircase in the dark, chances, unexpectedly, to step down two stairs at once when he had prepared himself only for descent equal to one. But a horse must be a great deal more subject to such like untoward events than a man. How often must *he* have to perform what he little anticipated he was going to do !—how frequently must he be forced or see occasion to be obliged to perform so much more or so much less than he had reckoned on, and more especially while in active pursuit in hunting or steeple-chasing !—and therefore we have a right to suppose that muscular lesion is a less uncommon cause of lameness than we are in the habit, in our practice, of providing for or seeking after. Because we cannot demonstrate to sight or feel the laceration or rupture that has taken place, we are apt to fancy or frame some other cause for the lameness ; and the horse, through being laid up, in time recovers, and we, continuing in the belief that our supposition was correct, are left



uninformed of the true cause of the lameness, notwithstanding the horse has got sound again.

The usual way in which such lamenesses have their origin appears to be during some act of hard galloping or leaping;—stepping unguardedly into a rabbit-hole, or upon some surface which gives way under the animal's weight. The horse immediately, or soon afterwards, falls “dead lame;” he can hardly limp, perhaps, out of the field or wood in which he happens at the moment to be going. He is said to have “ricked” (*wrecked*?) himself; but no sign of sprain is to be found. Perhaps, it is thought, he may have “picked up something” in his foot; but examination of that part is attended with no better success than the search after sprain. The case is vexatiously obscure: nothing can be seen, nothing felt, to account for the lameness. If the ailing member be a fore leg—as most probably it is—the limb is taken up into the arms of the examiner with a firm and close grasp, so as to enable him to swing it backward and forward; and he fancies one or both of these motions “hurts” the horse: still, there is nothing to make him quite certain that the horse, from such rough handling, does not *feign* being hurt; or that he in reality is not hurt; not in consequence of any lesion of muscle, but purely from the ordeal the examiner is putting him through. Still, however, I do not mean to deny that there may and do occur cases in which laceration or rupture, or other lesion of muscular fibre, if it exist, is likely to be discovered by manual examination of this or other kind, though a good deal in all cases of muscular rend or lesion must be determined through observation of the alteration occasioned by the injury in the horse's action.

Some years ago a very remarkable—indeed, as I thought at the time of its occurrence, an *unique*—case of ruptured muscle happened in my practice; but I have since found that so far from the case, rare as it may be, being unparalleled, we have only to turn over the leaves of Solleysel to meet with accounts of what appear to be the same lesion, under the head of “Relaxation and Straining of the Master Sinew.” Before I relate this case I will transcribe one which would appear less uncommon.



## RUPTURE OF THE FLEXOR METATARSI.

The following narrative,\* given in 1841, of an occurrence of this class of lameness, by Mr. Cartwright, V.S., Whitchurch, Salop, will be read with interest in this place.

“On the 21st of November, 1840, the Rev. R. Mayow, of this town, rode after the hounds a fine chestnut horse nearly 17 hands high. After a burst of twenty minutes they came to a leap, where the horse's hind legs slipped into a boggy ditch with his breast on the fence, and he thereby became staked in the breast, while his legs sunk in the ditch, and became fastened there. In a short time, however, the off hind leg was liberated, but the other he had very great difficulty in pulling out.

“When he came to the bank, it was found that some injury had taken place in the near hind leg. A farrier near Cholmondeley was called in, who said he had ruptured some of the muscles on the *back* of the haunch above the hock.

“The horse was brought home a distance of eight or nine miles. I saw him immediately after his arrival, and found him rather exhausted. I examined the breast, but found that no mortal injury had been inflicted. I then went to the hind extremity, and saw in a moment that there probably was a rupture of the flexor metatarsi muscle or its tendon, and most likely of the latter.

“The action of the limb indicated the loss of power of that muscle, as the leg could be bent at the hock completely straight behind, and he had no power of any importance before, in opposition to those antagonist ones—the gastrocnemii—behind. In some of his movements the limb appeared quite loose about the hock, and was occasionally knocked against the other leg. On moving him about, there was a twitching up backwards of the leg at the hock, and when he walked forwards, it was evidently done without the concurrence of the flexor metatarsi.

“There was a soreness in front at about six inches above the hock, and also a little higher up, and the usual tenseness and distinctness of the tendon could not be seen. There was no apparent pain of any importance.

\* Taken from ‘The Veterinarian,’ vol. xiv, pp. 273—4.

“*Treatment.*—In about two hours after he came home, I took four quarts of blood from him, gave some physic, and ordered fomentations.

“22nd.—I found him almost as lively as usual: continue fomentations, and keep him quiet.

“25th.—From the last date to this we continued to foment and keep him quiet. The wound in his breast is going on satisfactorily, and no doubt will do well. I now blistered the front of the hock and thigh to keep him quiet, and put on a cross line to the back of the fetlock and over the neck, so as to bring the divided parts into apposition. I also put on a patten shoe raised four inches, but we found he would not stand on it, but knuckled over, and most likely would have injured himself, so I took it off. After this he was merely kept quiet, and on the 20th Jan. 1841, was ridden out, and little was found to be the matter with him. He is now as well as ever, has been hunted several times since, and is regularly ridden.

“There was a case exactly similar to this when I was at the College last year, but how it occurred I do not know: it was sent out, after being kept there about three weeks, as incurable. What became of it I know not, but I should like to be informed whether it ever got well. About the same time there was in the College a case of rupture of the lateral ligaments, or side of the gastrocnemius internus tendon where it is attached to the side of the os calcis; and the consequence was, that the tendon slipped into the hollow, on the outside, below the os calcis and tibia.”

#### RUPTURE OF THE GASTROCNEMIUS MUSCLE.

Whether the annexed case be similar to the foregoing one, or be such as I at the time named it, I shall leave my reader to determine.

A 20, black troop-horse, four years of age, in the act of longeing early in the morning of the 16th of May, 1843, fell forward upon his head and knees, leaving his hind limbs sprawling in an extended position behind him. He lay for a couple of seconds, then rose up, and walked twice round the longe. Finding, however, that he had lamed himself in one

of his legs, the rough-rider, who had been longing him, returned him to his stable. At nine o'clock a.m. I had him led out in hand. He walked tolerably well; but when he came to trot, or even to turn, there was manifest a giving way of the off hind leg, owing, to appearance, to a want of contraction in the muscles bracing the tendo Achillis. This induced me at once to suppose there must have happened some rupture or laceration of the fibres of the *gastrocnemius* muscle; and yet my most careful examinations failed to detect any muscular defalcation or defect thereabouts. In fact, I could make out nothing more than unusual mobility of limb. I prescribed a high-heeled shoe, quietude, a warm bath, and a dose of physic.

On the 18th May—two days after the accident—the fore part of the hock was observed to be considerably swollen; and the swelling was tense and warm to the feel, as though some sprain of the part had taken place. In another two days this tumefaction had begun to subside, so that by the 25th—a week from the accident happening—the hock was well again.

The next time I saw the horse walk out—which was on the 2nd of June—I could not perceive any alteration in the action of the limb, either for better or worse. There was evident the same laxness or looseness in the tendo Achillis; the same instability and rolling movement in the limb as he walked along; nay, the latter was very observable in the stall even; every time the horse's hind quarters were turned from side to side there was manifest want of bracing of the tendon in question. Instead of retaining that well-known tensity and firmness of feel which it possesses so long as the foot rests upon the ground, the tendon remains slack, and absolutely wrinkles or serpentines in its course to the hock the moment the limb is lifted off the ground. No other view, in my mind, could be taken of the case than that expressed here in its heading. It will be recollected that the two gastrocnemii muscles cross each other in their course from the back of the stifle to the hock, and that, in their composition, fleshy fibres are interlaced with tendinous ones. Some of these had, possibly, given way in the sudden and severe extension to which they had been subjected in the fall; but by no inspection or examination of other professional men as well as myself—to

whom the case was shown—could discovery of the seat of lesion be ascertained.

THE TREATMENT OF THE CASE, in addition to what had been already done, consisted simply in forbidding all exercise or even motion of the injured part. The horse was kept constantly tied up in his stall until the Regiment of First Life Guards marched—which was on the 1st July—to Windsor; and subsequently was enforced the same standing, unmoved, in the stable; he not being suffered to lie down or even to turn round in his stall. He was kept confined in this manner for four months, and then had not lost either his lameness or rolling gait of hock. Thinking that exercise might now prove beneficial, he was on the 2nd of October turned out to strawyard, with his high-heeled shoe on. Five months from his being turned out he was taken up into the stable in consequence of his having become, without any further treatment, restored to a state of perfect soundness. There was no longer any slackness of tendon; nor was the roll the hock had in motion any longer perceptible.

Solleysel has a chapter headed—"Of the Relaxation and Straining of the Master Sinew;"\* which in a strange and remarkable degree is illustrated by the case I have just narrated, as I think the following extract will prove beyond the smallest doubt. Explaining what he means by the "master sinew," Solleysel commences by saying—"The hough is surrounded with a great sinew, which is divided from the bone by a hollow space where the *vessignons* (capped hocks) are usually situated. This is the biggest and most visible sinew in a horse's body, which by reason of a strain occasioned by hard riding, evil shoeing, going down a steep place, a *slip or fall*, or too heavy burthen, *may be relaxed*, and sometimes disturbed with so much violence that *it becomes moveable like an unbent bow-string*. When a horse walks, *the leg seems to hang at the hough, because its motion is not regulated by the master sinew*; and you would even sometimes imagine that the bone was broken. *When a horse stands with his foot fixed on the ground, the hough being extended in its natural posture, there is so little appearance of any grief in the leg, that it seems perfectly*

\* Op. cit., Part II, chap. xcix, p. 273.

sound; but if you handle the master-sinew, you will find it more moveable than that of the other leg; and *if you make the horse move his hinder parts, you will immediately perceive the sinew to be as loose and infirm as if it were broken.*" . . .

"Some horses, contrary to the expectation of all who saw them, have been cured with the following remedies; but *the cure of such strains is not the work of a little time.*" Had not my case been recorded seven years ago, at a time I little expected to meet with such an accident, much less to find any account of what seemed to me such a *rara avis* in any old work on farriery, so remarkable are the coincidences between my account and Solleysel's, that one might be led to think I had perused his before I wrote my own.

To this case of my own I with more confidence add the following cases kindly brought under my notice by Mr. Tombs, V.S., Stratford-on-Avon, late of the Bengal Horse Artillery, in whose practice they occurred.\*

*Dec. 10th, 1832.*—An aged troop horse was admitted into the hospital stable this morning, in consequence of severely injuring both hind legs by entangling them in the wheel of a gun carriage while at practice. There were slight contusions on the near leg: the off one was dreadfully bruised, and the horse could not rest the least portion of his weight on it. When held up, it appeared as though the tibia was fractured, the hock and leg having an exceedingly rotatory motion. On minute examination *I ascertained that the gastrocnemic muscles were ruptured where they become tendinous.* Six quarts of blood were taken from the femoral vein, and a patten shoe applied. Repelling lotions and fomentations were ordered, and a purgative administered.

*11th.*—Patient in *statu quo*. Fomentations continued.

*18th.*—No perceptible amendment. It is very strange that no swelling has taken place. The parts must be roused into action; therefore let a blister be applied.

*20th.*—The blister has produced a violent inflammation, and an enormous swelling. Treatment, fomentations and physic.

*27th.*—Inflammation abated; swelling less. He can now bear a little weight on the feet. Apply a charge to brace up the injured parts.

\* Recorded in 'The Veterinarian,' vol. viii, p. 267.



*Jan. 6th, 1833.*—The patient improving slowly; but when the foot is elevated from the ground, the leg has still a sort of rotatory motion. Continue the charge.

*20th.*—The injured muscles are extremely weak and relaxed. Patient very lame. This morning I adopted my favorite remedy for all long existing cases of lameness in the hock and legs, viz. the actual cautery, deeply and extensively.

*30th.*—Inflammation diminishing from the effects of the cautery.

*Feb. 10th.*—I had him led out; he walks much better. The patten shoe was removed, and a thick heel then applied.

*15th.*—Lameness going off rapidly.

*20th.*—The firing has had a very excellent effect: he can now trot tolerably well. The firing produced a deep-seated inflammation and effusion, which united the ruptured parts together.

*March 7th.*—Discharged fit for duty. I attribute the cure to the effects of the cautery, as it very soon made the horse a fit and proper subject for a species of military duty which is sometimes particularly laborious.

CASE II.—*Nov. 26th, 1836.*—A gentleman hunting with Lord Segrave's hounds, on Saturday, the 26th ult., jumped his horse at a ditch which he did not clear with the near hind leg. The horse made a violent effort to extricate it, and after this pursued the chase with unabated cheerfulness, and when the sport was over walked home, a distance of eight miles, quite free from lameness.

*27th.*—Slight lameness was perceptible.

*28th.*—I was requested to attend him, which I did, and found him extremely lame, unable to sustain any weight on the near hind leg, and barely touching the ground with his toe. Respiration distressingly laborious—pulse 80. He refuses all food—drinks excessively—the tongue is covered with fur—he is continually catching his leg up, and is in dreadful pain—no swelling visible in any part of the limb.

I examined his foot very minutely, and found no alteration or injury there to account for the lameness. I bled him largely from the femoral vein, and gave him aloes and hyd. submur., and ordered gruel to be given plentifully.

29th.—Purging freely—pulse 108—in agonising pain—continually catching his leg up. I cannot ascertain the precise seat of lameness. I extracted a thorn from the leg, but that could have nothing to do with the grievance. Tetanic symptoms are beginning to be manifest.

I took a gallon of blood from the neck, and he then began to swerve and perspire at the shoulder. The bleeding strangely and instantaneously relaxed the spasmodic affection of the muscular system, and the horse was enabled to put himself in a position to void his urine, which he had not done for two days. Foment the limb, and give opium and digitalis daily.

Dec. 1st.—Fever slightly abated. Pulse 70. Eats a little hay and carrots. I now perceive a swelling extending from the muscular part of the flexor tendons to the hock. The lameness is still extreme. Bleed from the femoral vein. Give drachm doses of aloes, tartar emetic, and digitalis, and foment the limb frequently.

5th.—Pulse 60; lameness and pain as acute as ever. He cannot put his foot to the ground, and moves on three legs. I again opened the femoral vein, and divided the periosteum beneath a part of the swelling six inches in length, and inserted a seton over the swelling. Continually foment the limb, and give febrifuges.

12th.—Pulse 50. Fever abated—feeds better—can bear a little weight on the limb—seton discharges. Foment as before.

19th.—No fever—appetite good—swelling of thigh and hock diminished, but very hard. The lameness still very great, and which continued so until the middle of January, when it was deemed necessary to destroy the patient.

*Dissection.*—The fasciæ of the muscles of the thigh, generally, considerably thickened; the cellular tissue connecting together the flexor muscles likewise thickened. On separating the gastrocnemius externus from the flexor pedis perforans muscle, a quart of liquid blood, mixed with pus, escaped. The muscles were strongly united and blended together by tendinous fibres, and it was with great difficulty that I separated them: in the centre of the gastrocnemius externus muscle I discovered a great rent of a portion of its

fibres, and a cavity which was filled with pus and coagulated blood. I observed spots of ecchymosis on various parts of the superficies of the muscles of the thigh. The synovia in the hock joint was of the consistence of glue.\*

Mr. Tombs once met, he says, with a similar case in a heifer, caused by getting her leg entangled in a stile; and adds, "I have recently had another case under treatment, which had a favorable termination: A roan cart mare, five years old, was upright in the stable-yard at night; in the morning she was quite lame—cause unknown. I saw her a month after the accident: every one who saw her before fancied she was lame in the stifle joint, and she was doctored accordingly. I fixed upon the hock as being the seat of lameness, when I saw her move at a distance, as she could not flex it, and from her hopping when urged to go fast. She straddled with and projected the lame limb out when walking. I could not discover any swelling, only a little heat on the superior part of the inside of the hock, which was blistered high up. After awhile, the tendo Achillis became enlarged: the precise seat of lameness was now apparent. With two months' treatment and rest from the time I first saw her, she was fit for work, being a little stiff, with a straddling gait of the limb."†

#### SHOULDER LAMENESS.

This lameness has already been described in one of the forms‡—for it has more than one or two, and probably more than three forms—in which it presents itself, under the head of "Lameness arising from Diseases of the Joints and Bursæ Mucosæ." Shoulder lameness formerly came under our notice as an affection of the *bursa* or sheath of the tendon of the *flexor brachii*, at the place where the tendon runs within its fibro-cartilaginous canal; wherefrom the disease may (as was shown then) extend to the scapular joint; or it may originate in this latter situation, causing ulceration and caries therein, the same as happens in spavin and navicularthrititis. On the present occasion, shoulder lameness is to be considered

\* 'Veterinarian,' vol. xii, p. 582.

† 'Veterinarian,' vol. xxiii, p. 573.

‡ In Part I of this volume, at p. 234.

as arising from impaired action of the shoulder the effect of some lesion, either laceration, rupture, wound, or contusion, of some one or other of the muscles concerned in its motions. Solleysel, as was observed before, has in his well-known valued work a chapter on "Shoulder-wrench, Shoulder-pight, and Shoulder-splait;" wherein he prefaces his account of these accidents by sagaciously informing his reader that the shoulders of quadrupeds "are not fastened to the body by large bones; but only applied to the extremity of the side, and held in their proper situations by ligaments (muscles?\*) which fasten them to the part. So that by a step, false step, or undue pressure of the leg, a horse may be easily *shoulder-pight* or *splaited*; i. e. some part of the shoulder may be separated from his body (*écarté*), which cannot be done without stretching of the ligaments (muscles)."

The fact of the body being suspended between the shoulders through the large mass of muscle interposed betwixt the scapular blades and the ribs, is of itself sufficient to account for muscular lesion being liable to happen in this part in particular. Not that we are to suppose that the muscular fibre is continually in action to maintain the body from falling; for of that we have evidence to the contrary in the structure of the muscles themselves; in their substance being abundantly interlarded with *tendinous* fibre: which we know in the body generally ever to be the case when successive or energetic action is demanded, of which there are many examples in the muscles of the extremities. In the case of the shoulder, this interlacing and intersection of tendon is evidently for the purpose of relieving the muscular fibre from continual action; while, from its causing the fibres to be less in longitude, and therefore stouter, it at the same time contributes much to the force and power of action of the muscles themselves.

It is no less a fact we seem likewise to have a sort of right given us by analogy and inference to assume, that the muscles of the shoulder, numerous and complicated as they are, and continual, and at times irksome, as their labour is known to be, must be obnoxious to lesion, rend, or rupture; and yet in

\* I have not by me a French Solleysel to ascertain what this word was in the original.

practice, when we have every reason to suppose such has happened, we find a difficulty in discovering its site and demonstrating its nature. The horse, while galloping or going hard, or in jumping or leaping, frolicking or frightening, or from stepping suddenly into something or upon something different from what he anticipated he should find it;—after some such manner as this, I repeat, the horse on a sudden falls limpingly lame; and the lameness from his gait and manner of using (as well as he can) the injured limb is clearly in his shoulder. The suddenness of the lameness, and the excess of lameness all at once, is proof pretty convincing that “sprain” is not the occasion of it; at least, not unless we are to include under that vaguely-defined and too comprehensive term all actual solution of continuity of parts, of whatever nature it may be. Of such an accident it is considered by some that the *wasting* of the muscles of the shoulder is a sufficient demonstration. Ruptured parts, however, involving rupture of blood-vessels, are apt rather to swell from extravasation of blood than to fall away; indeed, this latter can be but an after effect, one consequent upon and not concurrent with the lesion. I do not remember, myself, ever to have been led by any visible defalcation of substance or other outward sign to place my hand upon the spot where the lesion was. In a word, I know of no more direct testimony of its presence than the inferences we, through analogy of what happens in man, and sometimes, though rarely, in other parts of the body in horses, are able to draw in our minds with, it would seem, a sufficiently fair show of reason.

SOLLEYSEL, whose observations in reference to this part of our subject are far from despicable in the nineteenth century even, says—“’Tis hard to discover where the lameness lies, if you did not see him (the horse) get it, and if the horse does not cast his leg outward, or make a circle with it, instead of advancing it straight forward; for that is an infallible sign that the grief is in the shoulder.”—And again: “But if the horse be lame, and yet free of the above-mentioned infirmity in his gate (gait), turn him short on the lame side and observe carefully how he treads; for if the grief be in his shoulder, he will set his foot on the ground hardily (firmly), and endeavour



to favour his shoulder. If you cannot discover the part affected in this way, take hold of the fore leg and make him go backwards and forwards, that you may perceive how he moves his shoulder, and whether he does not complain and shrink when you put him on these motions."—"If the lameness be in the shoulder the horse will halt least while he is heated with riding; but if in the foot he will halt most when he is ridden."

Ready as I may, in common with others, feel myself to subscribe to much of the above quotation, as holding as true now as it was when it was written, yet does it not enlighten us upon the point whereupon we are seeking information. We grant, we have signs to direct us to the shoulder as the seat of lameness; but are we acquainted with which of these signs we are to take for rupture or lesion of muscle, which for sprain or lesion of the bursal apparatus of the *flexor brachii*, and which for inflammation or ulceration of the shoulder-joint itself? Because this is the distinctive point we desire to arrive at; and if we cannot reach it, and *satisfactorily* reach it, where do we find our *diagnosis*? So far as shoulder lamenesses are to be discriminated one from another, in point of fact, "nowhere!" All our judgment merges in the case being a *shoulder* lameness; and having said that, we have, in truth, said as much as we really know for certain about the matter.

#### STRINGHALT.

STRINGHALT consists in an involuntary or convulsive action of one or both hind legs.

THE SYMPTOMS of it are, a singular and ridiculous gait in the hind quarters, occasioned by the horse suddenly catching or snatching up one or both hind legs, sometimes with such force as to strike his fetlocks against his belly, particularly observable when first moved in the morning after a night's repose. No sooner, however, is the horse put into quick and continued motion, such as a full trot or gallop, than the stringhalt vanishes; so that in the fast pace we should not discover that the animal was the subject of stringhalt. It has been said that even in the slow pace, after a protracted walk,

the convulsive action "goes off," and "the natural action returns." My observation, however, does not confirm this.

THE FOLLOWING FACTS, connected with stringhalt, may be useful in shedding light upon its mysterious and disputed nature and seat. There are more instances, I believe, of its affecting one than both hind legs. It never—or at least extremely rarely—is seen in a fore limb; Blaine says, "he has met with one or two instances of it;" I have not seen one. Neither do I remember to have observed it in the young, or, at least, in the unbroke or unused horse. It is never cured, either by nature or art: once stringhalt, for ever stringhalt. As to the description of horse commonly affected with stringhalt, the well-bred animal of high nervous temperament, the fiery horse, "the devil to go," as he is phrased, standing in general estimation as the "capital" horse, is peculiarly obnoxious to the disorder. The approach of the disease, I believe, in general, to be gradual; though sometimes it comes on suddenly. Mr. Booth, of Bradnoss, in 'The Veterinarian' for February, 1842, mentions an instance of "stringhalt in a cow." It affected "the hind leg of the milking side." Mr. Booth pertinently adds, "Cows are subject sometimes to an awkward manner of walking with their hind legs, from having large (distended) udders, &c. *But this is a clear case of stringhalt.*"

SEAT AND NATURE.—From stringhalt being denoted by an action evidently involuntary or convulsive, the animal manifestly having lost all control over the limb from the moment it has quitted the ground, it seemed but natural to refer the affection to the nervous system. This was done by me, when writing on the same subject in my "Lectures," in the year 1823. The words I then made use of, were—"Such writers as offer any opinion on its nature, suppose it to be a *muscular* affection, mistaking, I conceive, the effect for the cause. I choose rather to refer its seat to the *spinal marrow*, or to the *nervous trunks passing between it and the affected muscles*: an opinion I was first led to adopt from having observed a broken-backed horse exhibit all the characteristic signs of stringhalt; which, in his case, was clearly only an accompanying symptom of the former disease. It was stated (in the foregoing part of this Lecture) that section or compression of the spinal marrow

paralyzed muscles, and that irritation of it convulsed them. Now, we know that many cases of broken back terminate in palsy. If this be true, why should not others be productive of *stringhalt*; since one arises from compression, while the other is merely the result of irritation? It is not, however, necessary for a broken-back to be present; for any other cause of irritation would, we apprehend, induce the disease. Horses are very subject to injuries of the loins—much more so than we seem to be aware of—from being suddenly stopped or turned, or from being over-weighted about these parts: accidents that are but seldom detected, since they may not be severe enough to constitute broken-back, though they may so far disturb the nervous functions as to cause stringhalt. Should the injury, or the consequences of it, be confined to one side, then only one column of the marrow will be affected, and but one leg convulsed. The nature and extent of disease will perhaps determine the degree of stringhalt.”\*

In May, 1833, Bond’s (a troop) horse, met with a hurt from a fall on turning in his stall while on duty at the Horse Guards. At first he showed the usual symptoms of “chinked” or “broken” back; afterwards, that wayward and incontrollable motion of his hind limbs which would seem to denote the approach of stringhalt: indeed, from his catcling-up action of the hind legs such an issue appeared more than doubtful. He was admitted into hospital for the injury, and after repeated bleedings and purgings, and blisters over the back and loins, and rest for nearly five months, he was—his case being hopeless—destroyed, having at the time decided stringhalt. There was found at the side of the body of the last dorsal vertebra, laceration of the *theca vertebralis*, accompanied by softness of the marrow and caries of the body of the vertebra. Some traces of inflammatory action remained; but there were no signs of effusion or suppuration.

Mr. Goodwin, veterinary surgeon to the Queen, did, and I believe still does, entertain similar views concerning the seat and nature of stringhalt. He has given, in ‘The Veterinarian’ for December, 1829, the case of a horse in the royal stables, who, having stringhalt in both hind legs, happened one

\* ‘Elementary Lectures on the Veterinary Art,’ vol. i, p. 231.

day to fall in the Riding School, from the effects of which he died. His body was examined, particularly as to his stringhalt, and it was found that three of his dorsal vertebræ were anchylosed, and the spinal canal considerably narrowed.

A highly interesting post-mortem investigation into the seat and nature of stringhalt was prosecuted with much care and solicitude on the carcass of the celebrated race-horse, Guilford, who, prior to his death, was so notoriously the subject of stringhalt that, "the belly was forcibly struck by the pastern joints every time the hind feet were lifted up: the belly and pastern joints (or fronts of the fetlocks) being both denuded of hair in consequence of this terrible battering." Such is part of an account I am about to give of this interesting narrative, from the pen of the late Mr. Youatt, contained in 'The Veterinarian' for August, 1838. The dissection "was conducted (at the Royal Veterinary College) by Mr. Spooner, occasionally assisted by Mr. Sewell and Mr. Ferguson. The following was kindly dictated by Mr. Spooner:—"

The muscles, with their *fasciæ*, as well of hind as fore extremities, exhibited their natural character, with the single exception of a "rather darker yellow in colour than is usually found." The crural and lumbar nerves were in appearance healthy. But "the sciatic nerve, at the aperture through which it escapes from the spine, was darker in colour than is usual, being of a yellowish brown hue. Its texture was softened, and its fibrillæ somewhat loosely connected together. The nerve was of its usual size. But on tracing it from the ischium, in its course through the muscles of the haunch, several spots of ecchymosis here and there presented themselves, and they were more particularly marked on that part of the nerve which is connected with the sacro-sciatic ligament. As the nerve approached the hock, it assumed its natural colour and tone; and the fibres given off from it to the muscles situated inferior to the stifle joint were of a perfectly healthy character. On taking out a portion of the nerve where it appeared to be in a diseased state, it was found that this ecchymosis belonged to the *neurilema* surrounding the whole internal fibres. It was confined to the membranous investiture of the nerve; for the substance of the nerve, when

pressed from its sheath, presented a perfectly natural character."

The spinal marrow and brain, and their coverings, were entirely free from anormal appearance.

The joints of the hind extremities were all likewise healthy in aspect.

"From the present post-mortem examination, and many others which Mr. Spooner had previously instituted, he was of opinion that this peculiar affection *is not referable to any diseased state of the brain or spinal cord*, or to any local affection of the muscles of the limbs, but simply to a morbid affection of the sciatic nerve. Other circumstances had more or less varied; *but he had not dissected a single case of stringhalt in which he had not met with disease of this nerve*: the nerve which mainly contributes to supply the hind extremities with sensation and the power of voluntary motion." This accounts for stringhalt being seated in the *hind* limbs.

FACTS DEDUCIBLE FROM THE FOREGOING DISSECTION—and facts of a weighty character they are—inform us, that neither brain nor spinal cord, nor muscles are in fault; but that the nerve which runs to the muscles of the hind limbs, *the sciatic nerve*, presents an abnormal appearance, consisting in *spots of ecchymosis* upon its membranous case or *neurilema*, which do not penetrate through to, or anywise change the healthy aspect of, the substance of the inclosed nerve. One question to be asked from this is, can we as physiologists regard this ecchymosed condition of the neurilema as sufficient to account for the symptoms of stringhalt? Another, is such a morbid condition of a nature never to be removed? This last question is asked with the view of ascertaining how far the answer may be found to accord with the notorious fact, that stringhalt is an incurable disease.



## CLASS III.

LAMENESSES ARISING FROM DISEASES OF THE TISSUES  
PECULIAR TO THE FOOT.*General Observations on the Diseases of the Foot.*

WHILE we hear but little complaint about diseases of the feet in other animals, we are continually reminded of horses being "lame in their feet." How is this? It is readily to be accounted for when we come to consider the habits, or rather the usages, of one domesticated animal as compared with those of another, and estimate the facts elicited from them by the ascertained laws of physiology. A physiological axiom of universal truth, and of especial application in the present case, is, that a vital orgasm, the same as any machine of human invention, wears out and becomes liable to disorder in pretty equal ratio to the use that is made of it. The horse being an animal of action, of labour, of speed, and yet one that is in the habit of lying down less, probably, than almost any other, puts his feet to great and continual trials. He trots hard, and for long together, as a hackney; he gallops hard, and for long together, and takes high and precipitous leaps, as a hunter; while he strains every nerve and sinew as a racer. And these feats of labour and speed he very commonly performs either upon hard and rough ground, or upon artificial roads and pavements of too unyielding a description to make any return save that of concussion to the continual battering of the animal's hoofs.

But the hoofs are found by experience to be insufficient protectors to the feet against the roads and pavements art has introduced for purposes of communication; and the consequence has of necessity been, the invention and employment of *horseshoes*. And here we have another prolific source of foot-lameness in horses; and especially when considered in combination with the former: the two together constituting the main causes of diseases incident to the plantar organ. Nor shall we feel surprised at this when we come to contemplate the intricate and beautiful mechanism of the interior of the foot, and to consider how the functions of its several parts are liable to be interfered with or obstructed, or the tissues them-

selves to become mechanically injured. In the present state of the art of shoeing the iron horseshoe must be regarded as a necessary evil. That it is productive of a variety of harm, immediate and remote, to the foot, there can be no doubt. But then we cannot do without it. Our roads have been such, of late years, as more than ever to call for defence for the foot. We have improved *them*, but left our horseshoes in the state they were, notwithstanding it has been the chief aim of those who have studied farriery to shoe horses in such manner as should, while the shoe afforded the required defence and durability, in the least impede or incommode the ease and action of the foot.

But the foot is not only a part peculiarly obnoxious to disease, its diseases themselves manifest peculiarities, owing to being seated in tissues differing, in some cases remarkably, from tissues of the body in general. The horny case in which they are enveloped likewise places these tissues under conditions different from those of other parts. The sensitive laminae are of texture and function unlike other parts. The coronary body, again, has its peculiarities; and so have the sensitive sole and frog; and what is called the fatty frog also; and even the coffin-bone itself. Navicularthrititis is the disease of the foot which alone belongs properly to a class affecting other parts (joints) in common; and for that reason has already been treated of in another place.\* The diseases we have now to treat of, so far as affecting the same organ, and that alone, form a class by themselves; yet do they differ in nature, cause, and treatment, one from another, as much almost as any diseases of the body can be said to do.

#### LAMINITIS.

##### *Fever in the Feet—Acute Founder.*

OF THESE THREE APPELLATIONS for the same disease *laminitis* is the name most in accordance with our modern nomenclature; *fever in the feet*, the one most in common use, and, indeed, most expressive of the translated form of the disease; while *founder* is very significant of the utterly helpless,

\* In "Class I," under the head of "Lamenesses arising from Diseases of Joints and Bursæ Mucosæ:" see Part I of this vol., p. 131.

and but too often hopeless, condition of the patient. Calling the animal "*founded*" literally signifies, in the language of our dictionaries, that he is "in a ruined or ruinous state or condition;" a meaning assumed on the authority of our oldest writers. Chaucer says,

"His hors lepte aside and *founded* as he lepte;"

that is, fell to the ground (*fundus*) or grounded, the same as a founded ship is said to do. For general use, I prefer the name *laminitis*, on account of its scientific origin, as well as for its brevity; although I am not quite sure that it is comprehensive enough in its import to be free from objection.\*

HORSES, THOUGH THE ESPECIAL, DO NOT APPEAR TO BE THE EXCLUSIVE SUBJECTS of the disease. In THE VETERINARIAN for 1835, Mr. Ball, of Launceston, has related the case of a milch cow who, after calving, "caught a chill, which first settled itself in the udder and partly in the feet;" but was subsequently, "by some topical application" to the former, translated into the fore feet, "causing the poor beast to hobble along like a founded horse." The cow recovered under Mr. Ball's treatment, though it was administered late. Such comprises the substance of a narrative which would have been more valuable had it been more circumstantial and amplified. D'Arboval accounts for the disease being especially seen in the solipede animal, from the hoof in which the foot is inclosed being one single, hard, resisting case, insusceptible of expansion—in his own words, "*qui n'est pas susceptible de ceder*"—and from the foot, in consequence, being more likely to breed such a malady than one that is cleft or divided after the fashion of the hoof of the *didactyle*.

Mr. Gregory, V.S., Bideford, has corroborated this occasional extension of the disease to the *didactyle*.

"Amongst my employers," says Mr. G., "are some cattle-dealers who buy very largely of young oxen or steers (as they are called here in the west). Some of them are driven from fairs and markets for a considerable distance, to be kept for a month or two to freshen on the farms of my clients previous to

\* Professor Vatel calls the disease *Podophyllitis*, a better name for it, probably, than laminitis.

their being offered again for sale. Perhaps the next day after the arrival of one of these herds, especially if the weather be hot at the time, my attention is called to one of these animals. I find him down, and apparently suffering pain, evinced by throwing about the head, &c. The appetite for food is gone, and he breathes quick ; shows great disinclination to rise, and, when got upon his feet, great difficulty to walk, nay even to stand, shifting and throwing the weight from one foot to another. Examining the limbs from above downwards, until we reach the feet the seat of the disease is not detected. These are intensely hot and very painful, and sometimes, but not always, swelling about the coronets, showing evidently that inflammation is there existing. The disease progressing, after some little time, as the result of the inflammatory action, a separation of the hoof may be seen to take place around the coronet, and purulent matter to issue from the fissure. The hoof is now gradually thrown off, which is a long and tedious process, and the growth of new horn must take place before the poor sufferer recovers. This is a work of months."

This disease "differs altogether from what the late Mr. Youatt and others, in their writings, have called FOUL IN THE FOOT."—*Veterinarian*, vol. xxiii, p. 582.

THE FORE ARE THE FEET COMMONLY ATTACKED BY LAMINITIS. Otherwise, all four feet are usually seized, and commonly simultaneously, with the disease. The hind feet will sometimes follow the fore in attack, owing, it is said, to so much additional burthen being cast upon them ; but, to the exemption of the fore, they rarely suffer. The late Mr. John Field relates two cases\* of such an occurrence. And Hurtrel d'Arboval† has detailed the symptoms of laminitis in the hind feet, as distinguished from those characteristic of the disease of the fore. I have had an example of the disease in one fore foot to the exclusion of the remaining three ; and in the progress of the case the coffin-bone protruded through the horny sole, notwithstanding its fellow (fore) foot remained sound.

For the reason why the fore rather than the hind feet should become obnoxious to laminitis we must revert to the

\* In his 'Posthumous Veterinary Records.'

† In his 'Dictionnaire Vétérinaire,' Article "Fourbure."

larger proportion of the burthen they have to support, the weight of the head and neck being added to that of half the body; and also to the concussion they sustain in action, as compared with that undergone by the hind feet. When horses are standing on board of ship—a situation in which the disease, or the predisposition to it at least, has strongly marked itself—from rocking about with the motion of the ship, the fore limbs, as props and stays to the body, are undergoing more than the hind; and their duty under such circumstances becomes, if long continued, both laborious and painful; in which condition the disease, or the aptitude to take it, ensues. The battering the fore feet receive in action, and particularly when they come flat down upon the ground, is a strong reason for their greater susceptibility to disease than the hind, the force of whose tread under exertion comes after it is grounded, and is sustained principally by the toe of the foot.

THE BREED OF HORSE AND KIND OF FOOT most liable to take the disease, from my own observation, I should pronounce to be the under-bred horse and cart-horse, possessing the characteristic foot of the family, viz. the flat, broad, spreading foot. When high-bred horses, having upright oblong feet, become attacked with laminitis, there generally exists some manifest exciting cause. This is a point, however, on which there is some strange difference of opinion: D'Arboval asserting that the narrow foot, clothed with a hard, tough, compact hoof, is the most susceptible; while Giraud is of the same opinion as myself; remarking, however, that whenever the disease *does* attack the strong foot, it is more painful to bear. Mr. Spooner, in his edition of White, says, "it most frequently attacks horses whose crusts and laminæ are weak and very obliquely placed." And, if we come to reason on the matter, it seems but natural that such should be the case, since in such kind of feet the laminæ are most called into action. In feet disposed to take the disease, shoeing may have something to do with its production. The taking of the bearing of the shoe off those parts of the sole which are in union with the crust, and which are able to bear it, and throwing the entire stress upon the edge of the crust and upon the nails, as too commonly is done in ordinary shoeing, may conduce to the



production of such a disease. Likewise horses transported from mild or cold climates into hot countries appear disposed to breed the disease. D'Arboval informs us that such occurrences are not uncommon in Spain.

THREE KINDS OF LAMINITIS are recognised in practice, viz. the *acute*, the *sub-acute*, and the *metastatic*; the *chronic* being the declining or convalescent stage of one of these three kinds of disease rather than a distinct species or variety; and the *epidemic*, only an occasional, and I believe but a rare, character assumed by laminitis.

#### *Acute Laminitis.*

Were a veterinary surgeon asked the question from what disease a horse experienced the most suffering, he would, methinks, require little reflection before he determined in favour, or rather in disfavour, of the one I am about to describe. There may be, and no doubt are, other morbid conditions from which the animal suffers most acutely for the time; but there is no one in which his pain, while it is poignant in the extreme, is apt to be so protracted as in laminitis. At this we have no reason to be surprised when we come to remember that the impaired tissues are peculiar in their nature, besides being placed under peculiar conditions, in being situate between two hard bodies—the hoof without and the coffin-bone within: so that, when the tumour of inflammation would take place, the opposition of these unyielding bodies, and consequent squeezing of the nervous filaments, morbidly sensitive as they now are, produces pain in the extreme, probably some such in character as whitlow occasions in our own persons. And this exquisite pain it is, combined with the situation in which it is felt, that gives rise to a series of symptoms at once distressing and singularly characteristic.

THE APPROACH OF ACUTE LAMINITIS is not, as has been represented, at all times *sudden*; more commonly some symptoms of lameness or fumbling going will usher in the attack. A marked difference will often be discovered in the animal's gait: he will step shorter than usual, or, as grooms are apt to express it, "scramble," treading more upon his heels than upon his toes. D'Arboval has remarked that laminitis never *imme-*

*diately* succeeds the application of the cause giving rise to it ; but that a horse coming off a journey or trying feat of any kind will stand in the stable for an hour or more before the laminitis, the consequence of it, becomes developed. This, Professor Rigot accounts for by supposing that exercise augments the capillary circulation of blood through the foot, while rest proves unfavorable to it. After great exertion, the plantar vessels become surcharged to that degree that the veins are rendered incapable, during subsequent repose, of relieving the capillaries ; hence congestion, followed by inflammation.

THE SYMPTOMS OF ACUTE LAMINITIS—supposing the disease to be, as it usually is, confined to the fore feet, and to be perfectly developed—are of so marked and peculiar a character that they can hardly, by a person pretending to any experience, be mistaken. The horse presents himself in a paroxysm of pain. Should he be standing, his posture is crouched, or “all of a heap,” as the stable phrase goes, and he is panting and blowing from the terrible agony he is enduring. His general aspect and position is at once striking and characteristic. His hind feet are advanced underneath his body as far as he can get them, in order that he may relieve his painful fore feet all he can from bearing any portion of the superincumbent weight. If urged, or rather forced, to step forward—for walking is out of the question—most unwillingly he makes an effort to do so ; and his method of accomplishing it is expressive of no disease save laminitis. Instead of advancing one fore foot as ordinarily, he commences by shuffling his hind feet still further underneath him, and then either steps, first with one fore foot and then with the other, most gingerly upon his heels, or else with an effort lifts both fore feet at once, and makes a sort of timid leap forward. In this manner he accomplishes progression to a very limited extent, after being compelled to muster all his courage to do so. If one (fore) foot suffer more than the other, he will show it in these efforts to move, if not at the time he is standing still. Should the patient at our first visit be found lying, his efforts to rise upon his painful feet are as singular and methodical as his attempts to walk. He is probably lying stretched out upon his side, pawing and scraping with his fore feet, from the pain in them. The moment he finds himself

compelled to rise, he rears himself up upon his side, gathers his hind feet together underneath him, and, making them the *fulcra*, with a resolute and powerful effort he suddenly springs up upon his hind quarters, contriving, in the act, to keep his fore feet aloof from the ground, sometimes by poising them in the air ; or, if compelled to put them down, he does so in such manner as saves them from taking any of the bearing ; and he is no sooner up than he resumes the peculiar crouching posture afore described. This commotion increases his sufferings, so that he pants now harder than ever, and quite sobs or grunts with pain. One would think that the recumbent posture would be that affording most relief to the poor sufferer : this, however, does not appear always to be the case ; for in many fatal cases the standing position is doggedly maintained to the very last. The horse, although evidently in the greatest state of suffering, will not lie down ; but will stand in one corner of his box, with his nose over a pail of water, pawing and scraping, either with one foot alone or alternate feet, all day long and all night long. On the other hand, some horses will stand at rest, or, at least, only shift or raise their feet, one or both of them, for the sake of getting ease. This variableness in regard to standing and lying down in the disease has led to some disputes among veterinarians of experience ; such, however, ought to have admitted of adjustment by the notorious facts that both parties were in a measure right and in a measure wrong.\*

*When the hind feet are exclusively affected*, D'Arboval informs us that the attitude is altered. Instead of the fore feet being advanced, and placed as much as possible upon the heels, they are directed backwards underneath the body in order to relieve the hind, which are still brought forward to support all the weight they can upon their heels. And the attempt to walk now becomes even more formidable than before ; for, positioned as central props of support as the fore feet now are, underneath the animal, their removal costs him a greatdeal more pain and effort. And, from being unaccustomed to bear so much weight, they remain, the same writer goes on

\* See the discussions of the London Veterinary Society, in 'The Veterinarian' for 1829, vol. ii, p. 39.

to say, not long in this situation before they become affected themselves with the disease.

*This extension of laminitis to all four feet* makes matters still worse. The standing becomes now so painful and insecure, that the patient is more likely to lie than to keep erect. The recumbent is a posture, indeed, so much at present preferred, that we have insuperable difficulty in rousing him up upon his feet. As for walking, he can hardly manage progression any how,—will not, indeed, attempt it.

*The hoofs are hot.* The inflammation is so intense, that heat is transmitted through the (nearly half-inch) thickness of the crust to our hand. The sole of the hoof, and the frog even, likewise feel hot. Blood has been seen to ooze from the coronet.\*

*Throbbing of the pastern arteries* is another well-marked symptom. These are the vessels which supply the inflamed parts with blood. They are, under inflammatory action, in a state of fulness, and pulsate violently under pressure of the fingers. There is also

*Fulness of the pastern and coronet, and tenderness*, sometimes, of the sole as well. Indeed, D'Arboval maintains that the disease (*la phlegmasie appelée la fourbure*) itself reaches these parts, and the joints which they go to form as well. After a time the coronet loses its fulness, and manifests, especially on pressure, a sinking inwards. Sometimes the legs are swollen.

*The pain*, in addition to the unmistakeable evidence we have already had of it, may locally be made manifest by tapping the hoofs with some hard body, such as the handle of a smith's hammer, or, so far as the sole is concerned, by compressing it with the pincers. Altogether, it is of the most distressing character, disordering the whole system to that degree, that

*Constitutional or symptomatic fever* is the inevitable consequence. The animal is alarmingly ill; very much excited; has a most anxious look; feels hot all over; oftentimes is actually sweating through the agony he is in. His mouth is parched; his very breath is hot; his respiration is short, hurried, and painful; his pulse very high, and full and remarkably hard; his mucous membranes are all vascular and scarlet

\*. 'Posthumous Veterinary Records' of the late Mr. Field.

from irritation ; parts of his body are in a state of tremor ; he is continually changing either his position or situation in search of relief—his very countenance imploringly asks for it ; and if it be not, in some shape or another, found or administered, there is danger, from the fever of irritation running so high, of the poor sufferer succumbing, or, at least, of being reduced to that deplorable condition wherein, human aid proving unavailing, it becomes a real act of humanity to recommend a pistol being presented to his head.

DIAGNOSIS.—With symptoms so strongly marked as those I have described as characteristic of *laminitis*, persons acquainted with the disease cannot but express surprise when they hear of its occurring unrecognised, or of any other disease being mistaken for it. I have heard my professional predecessor, the late Mr. Bloxham, say, that he was on one occasion called in by a veterinary surgeon practising in London, to be consulted as to the treatment of a horse suffering from supposed “inflammation of the *kidneys*.” He found the patient upon his side, kicking and pawing in violent pain, and was told that “pressure upon the loins increased this great pain.” Mr. B., however, suspecting what was amiss from finding the feet very hot, requested that the horse might be made to rise. This had been deemed impracticable. At length, however, after some fresh trials, with the usual difficulty and peculiarity of effort, the standing posture was effected ; and no sooner was it accomplished than “the tale was told”—the nature of the disease was made manifest beyond a doubt. And this constitutes the best method of procedure whenever the animal is found lying, and any doubt impends as to what is amiss with him.

The heaving of the flanks and the dilated nostrils, indicating apparent embarrassment in the respiration, coupled with the circumstance of the patient being found standing, is apt to lead the inexperienced to suppose that the *lungs* or the *pleura* is the seat of disease. Any forced attempt to step or walk, however, would immediately dissipate such a notion as this ; though it is possible the same might induce a supposition that the kidneys were the seat of disease. The posture in which the animal is standing, and the attempt to walk, with reference to the fore feet being the parts in pain, would, however, by a



little attention, speedily correct so flagrant an error in judgment; and if the hind feet were affected also, they would not be placed flat and firm upon the ground, as in nephritis; added to which, the diagnostic characters of disease in the kidneys will come to the practitioner's aid to further remove all doubt on the question.\*

THE CAUSES OF ACUTE LAMINITIS are said to be various. There is one, however, among them so predominant and influential in its character that it must never be lost sight of; and that is, *work*, or what may be construed into *violence done to the feet*. A horse with high stamping action, going any great distance or for any length of time upon a macadamized road, or hard ground or pavement of any kind, will be a very likely subject for an attack of the disease; and particularly one who, from being idle or at rest and unseasoned, is brought to do work of the kind suddenly and without any preparation. After feats of trotting, galloping, hunting, and racing, horses become liable to an attack of laminitis, even though every precautionary training have been practised; but in cases where no preparation has been made, as in the instance of horses young and recently broke, comparatively little exertion will be liable to bring it on. A five-year-old horse of my own, recently broke into harness, was seized with acute laminitis, on a hot summer's day, when the ground was dry and hard, after a drive of not more than five miles, and that at an exceedingly moderate pace. And Mr. Braby, whose experience among cart and dray horses is acknowledgedly great and valuable, informs me, that young horses of this description, when they first enter on their London work, are particularly obnoxious to the disease, owing, he believes, to their wearing heavy shoes, and working day after day in them upon stone pavement; the injurious tendency of which is not a little augmented by the great weight—as much as two tons on an average—such horses while at work have to sustain upon their backs. The bevelling of their shoes, as is customary, inwards—in place of outwards—from throwing the superincumbent weight upon the border of the crust of the hoof, and upon the nails penetrating it, may likewise conduce to such an untoward result.

\* See the author's 'Hippopathology,' vol. ii, p. 342.

The act of standing for any great length of time upon any dry hard surface, particularly when watchfulness and more or less exertion on the part of the animal is continually required to maintain that standing, as is the case with horses on board of ship, has been known to produce the disease extensively. And that it is the continuance of the standing posture which causes the evil, appears from the fact of such horses commonly escaping the disease as are known to crouch or sit in the ship. In the expedition to Corunna, the late Mr. Castley had an excellent opportunity of observing this. That beautiful brigade of cavalry, consisting of the 7th, 10th, and 15th Hussars, landed at Corunna about the 20th Nov. 1808. They had been on ship-board, owing to contrary winds, upwards of three weeks. A few days after disembarking, they marched up the country, by squadrons, in daily succession, occasioning, thereby, the last squadron to be later in its march by nine days than the first. Mr. Castley himself marched a day after the last squadron, and found at Betanzos, the first stage, twenty horses left behind with fever in their feet, the greater part of them belonging to the squadron that marched *first* from Corunna. And such continued to be the case, more or less, all along the line of march. Still, the first suffered much more than those that marched last; a circumstance inducing Mr. Castley to believe that the *immediate* exertion the horses were put to, after having stood upon their feet so long on board of ship, had much to do in causing the disease. The suspension girths with which ships are now, or ought to be, fitted up, together with a clay or other soft and cool standing, is the precaution recommended to be adopted to prevent this grievous consequence. Railroad travelling, when the journey or long continuance in the train comes to be great, is not unlikely to have similar evil tendency.

Drinking a large quantity of cold water while heated has, it is said, I believe on sufficient authority, been followed by laminitis. The ancients thought so, and modern practice seems to confirm this. Gorged stomach, likewise, has been known to occasion the disease. In the same volume of THE VETERINARIAN\* from which I have been quoting, Mr. Castley

\* 'Veterinarian' for 1830, vol. iii, pp. 198, 199.

informs us, he once heard Professor Dick, in his Lecture, say, "he had frequently seen laminitis arise from overloading or gorging the stomach with food. A horse, perhaps, gets loose, and eats an extraordinary quantity of any kind of grain: an attack of inflammation of the feet is likely to be the consequence. And such is the sympathy between the stomach, the alimentary canal, and the cutaneous surface, that, if we regard the hoofs as a continuation of the common integuments, this is not to be wondered at." The action of cold water upon the heated body may be similarly accounted for. And this likewise may account for certain kinds of food, such as barley and rye and wheat, having a tendency to produce it.

METASTASIS of inflammation from the lungs to the feet, after inflammation in the former has happened to be severe and is becoming protracted, is a mode in which laminitis on occasions takes its rise.\* The inflammation is then said "to fall from the lungs down into the feet;" though it oftener happens that the inflammation "falls" into the joints, producing "rheumatic lameness."† As soon as the metastasis has taken place the lungs become relieved through it; nor is the fever that has "fallen" into the feet of so violent and unmanageable a character as is idiopathic laminitis.

It is said that the lungs, in their turn, may become affected through translation of the inflammation from the feet; to which I would add, that this seems more likely to happen when the lungs are already in an anormal condition.

*Metastasis from the bowels to the feet* is hardly less rare. Purgation and *diarrhœa* end occasionally in fever in the feet, and seem more especially likely to do so whenever any check or diversion is given to the increased and inflammatory action going on in the intestines—and stomach, as well, perhaps. "Catching cold in physic," as it is called, is not at all unlikely to turn into an attack of laminitis. Indeed, without any distinct evidence that "cold" had been taken, I have known an attack of laminitis, on more occasions than one, seize horses

\* It is my constant practice, whenever a horse is seriously ill, to take his shoes off. This, it is possible, I think, might have a tendency to prevent the translation.

† 'Hippopathology,' vol. iv, p. 35 *et sequent.*

just out of their physic, or at the time the physic was setting. Colic and enteritis likewise have been known so to terminate.

*Metastasis from the brain to the feet* is more rare: it has, however, been known to take place.\*

*Metastasis from the eyes to the feet* is a prevalent notion; though one, I believe, little confirmed by practice.

METASTATIC LAMINITIS is a less violent and dangerous disease than idiopathic acute laminitis. It commences in a system already depressed and worn by disease, and this seems to account for its comparative want of severity and danger. When once, however, the inflammatory action has betaken itself to the feet, the lungs or bowels or brain, as the case may be, become no longer the object of solicitude, in consequence of the evident decrease in intensity the same action has undergone in them. In one point of view, therefore, metastasis is favorable. So far as the pulmonary or bowel disease is concerned, it may prove the means of saving the animal's life. On the other hand, it is possible, unless the case be skilfully managed, that translated laminitis may, like the idiopathic disease, end in disorganization of the feet, and consequent irremediable founder. For the same reason that the metastatic disease is rather sub-acute than acute, we cannot—even supposing the case called for it—attack it with the same freedom and boldness we could the idiopathic form; the powers of the constitution, at the time the former sets in, being, in general, in too reduced a condition to admit of this.

LAMINITIS MAY PROVE EPIDEMIC OR SPORADIC in its character. There are seasons—hot summers, perhaps, more particularly—in which the disease has been observed to prevail, if not in all parts and places, in some, and to an alarming extent. I cannot say I have seen this occur in my own practice, but I know those who have experienced the sad visitation; and grievous the consequences of it have proved.

THE PROGRESS OF ACUTE LAMINITIS is marked by that pain and distress to the animal which cannot fail to excite compassion for him from all around, while even his medical attendant feels himself unable to refuse sympathy for his suffering patient.

\* On the authority of my late father, Mr. John Percivall. *Vide* 'Veterinarian' for 1829, vol. ii, p. 15.

Day and night, night and day, is but one continued scene of loud and sad complaint: the patient being found either lying and groaning and kicking about in torment, or else standing and breathing hard and quick, and oppressively, looking most imploringly, and pawing or shifting his feet without intermission. This distressing scene holds as long as the third or fourth, or, may be, fifth day; and then, in the event of our treatment proving at all successful, some abatement of the pain and fever may be looked for, and we may venture to hope our patient so far has weathered the storm favorably. But should no such propitious change be apparent, no glimmering of amendment be perceptible, we may augur badly of the result. Flesh and blood cannot for any great while longer maintain their vital force against so furious and unrelenting a foe.

THE "TERMINATIONS" OF LAMINITIS, as they are called, may be said to be four:—*Resolution, effusion, suppuration, and mortification*. And these may be reckoned usually to occur in the order in which they are here set down; though they rarely can be said to take place independently or singly.

*Resolution* is commonly meant to imply, the disappearance of a disease without leaving behind it any ill consequences. If a horse, therefore, having had laminitis, recovers without experiencing any material deformity of hoof and consequential lameness, his disease is properly considered to have terminated in resolution. So that resolution becomes the termination beyond all others to be sought after;—the only termination, in fact, which leaves the foot free from any such alteration of structure as amounts to disorganization, and consequent impairment or destruction of its functions. About the third or fourth or fifth day we hail with joy symptoms of the disease giving way. The pain and fever is diminished. The horse stands firmly, and without flinching, upon his feet, which have lost their burning heat; and even moves them with tolerable willingness and ease; and does so of his own accord, to change his posture or walk round to his manger. For now his appetite begins to return, and his aspect altogether is changed from despondency to comparative cheerfulness. Not, after all, that the feet return to their normal condition, as, in a strict patho-



logical sense, resolution would seem to imply. Such, in practice, we do not find to be the case : effusion, more or less, invariably occurring, and, for a time at least, remaining.

EFFUSION, therefore, is in a measure involved in resolution, though the meaning commonly assigned to it is a termination in advance of that stage. Instead of the crisis we are about the third or fourth day anxiously looking for, the disease continues, though with unincreased violence, two or three or more days longer, and then the pain and suffering abate, and the animal appears to be surmounting his troubles ; though, as but too frequently follows, it is but to experience others of another kind, arising from the effusion into, and consequent disorganization of, the parts within his hoofs, which is at the time proceeding. Our earliest indications of this are, some marked alteration in the form of the wall of the affected hoof in front—some unnatural slope or *falling-in* of it, and this is accompanied by *sinking of the sole* ; not to the extent to constitute *pumice*, but still enough to show that alterations are taking place, in consequence of the disease, in the relative situation and connexion of the parts within the hoof. When the effusion is more extensive as well as of a more intense character than this, we perceive indications of mischief going on at the coronet. The coronary body loses its rotund plumpness ; becomes flattened and even sunken ; and when pressed by the finger imparts a soft boggy feel, and pits upon pressure, arising from a sero-lymph effusion into its substance, which the pressure causes to ooze out. This is accompanied by separation of the encircling border of new-formed horn, with its thin wafery edging, from the true skin, with which in health it is continuous and inseparable ; and sometimes to such an extent, that the finger insinuated between the coronary border of the hoof and the sensitive parts underneath, on either side, finds a ready passage to the heel of the foot. All this portends mischief, the next stage being

DESCENT OF THE COFFIN-BONE AND BULGING OF THE SOLE ; and when this has become ascertained—as the appearance of the sole itself will give unwelcome intelligence of, as well as the sinking or indentation inward of the wall—our hopes may be said to have all merged into despair. The coffin-bone can

never be raised again into its place—even though it may not have protruded through the horny sole, which is sometimes the case—the sole never again restored to its normal state, and therefore the lameness arising from the tenderness of tread consequent thereon becomes permanent and irremovable; notwithstanding there be cases, as we shall find when we come to consider the sub-acute form of the disease, which admit of mitigation so far as to enable the animal to perform certain duties at, for the most part, a slow or walking pace. This is the only consolation left to us. At the same time we must bear in mind, that the protrusion of the coffin-bone through the horny sole is the signal, in most cases, for the destruction of a life reduced to eke out its existence in a state of suffering and wretchedness. But now and then we have, instead of this displacement and disorganization of parts taking place,

**SUPPURATION OF THE FOOT.** Purulent matter at first makes its appearance in scanty patches, mingled with the serous or sero-albuminous effusion at the coronet. By degrees, pus becomes the predominant secretion; so that what with parts in succession taking on the suppurative action, and the pus itself collecting and gravitating and spreading in every direction, gradually a separation is worked between the sensitive foot and its horny case, until, in the end, the latter, losing all hold and connexion, is *cast, i. e.*, is thrown off the foot, the same as a loose shoe is kicked off one of our own feet. Of this, of course, the consequences are grievous in the extreme; since through such a catastrophe the case of our poor sufferer is rendered utterly beyond the pale of all remedy and hope, and he himself has become a fit subject only for the knacker's yard.

**MORTIFICATION** may be expected to ensue in cases wherein the inflammation in the feet assumes a congestive character, and no relief is afforded the over-loaded blood-vessels, either by treatment or morbid issue. The swollen tissues of the sensitive foot, with the horny wall opposed to them in front and the coffin-bone behind, can in nowise obtain relief save through pressure upwards towards the coronet; and therefore it is that, unchecked by timely or efficient treatment, or for want of any treatment at all, distended and strangulated as they are, they fall into mortification. Inflammation continues to

rage with unabated violence ; suppuration does not follow ; there may or may not be changes evident, externally, around the coronet ; nevertheless, pain and fever terribly harass the patient, until, exhausted by his ceaseless sufferings, he dies of mortification. This has been known to happen so early as the second day, though other cases have run on as late as the fourteenth day, and then so terminated. After death, if we examine the feet, we find little or no displacement of parts : but we find serous effusion upon the surface ; the sensitive laminæ full of blood and almost black, and, with the slightest force that can be used, detaching themselves from their union with the horny laminæ. And even the coffin-bone—which was on one occasion, in which the *hind* feet proved gangrenous, sawn through by the late Mr. Field—is found to exhibit “an almost equal degree of blackness.”\* The peculiar situation of the sensitive laminæ, between the coffin-bone and the hoof, renders them, as has been before observed, under high congestive inflammation, very liable to become squeezed, and in a measure strangled, between the two hard substances by which they are fenced ; and it is under such circumstances, I repeat, that mortification or gangrene is produced in them ; of which the animal sinks rapidly, and dies at last almost unexpectedly, after having suffered days and nights of the intensest torment and agony.

CHRONIC LAMINITIS, a stage the acute disease will every now and then run into, instead of declaring its termination in one or other of the ways but now pointed out, and whose consequences are different in some important respects from any we have yet examined, will be considered in speaking of sub-acute laminitis.

THE PATHOLOGY OF LAMINITIS brings some facts before us which, while they are of a different nature from others happening under similar circumstances in other tissues, are important for us to become acquainted with, from their serving to explain certain phenomena occurring in the course and termination of the disease. It seems not only ascertained that all the soft tissues of the foot participate more or less in the inflammation, but it is equally so that the coffin-bone

\* Posthumous Extracts from his Veterinary Records, p. 200.

itself, which is perforate in every part for the passage of blood-vessels, likewise partakes of the inflammatory action. Now, by these perforating blood-vessels it is that the secretion of horn is carried on; and since it is a law with secretory organs, that under inflammation secretion is either augmented or diminished, or else altogether suppressed, so must we expect the secretion of horn to be in one of these ways affected under laminitis. At first, or during such time as inflammation is just beginning or moderately prevailing, or indeed at the time that the inflammation is on the decline, the secretion of horn may become augmented; but when, as in acute laminitis, inflammation runs fearfully high, the secretion of horn becomes stopped: the secreting vessels oozing forth in lieu thereof serous fluid or coagulable lymph. The effect of this is—as well from the want of the adhesive cement of the new horn, as from the interposition between them of serum and coagulable lymph, or of pus—disunion and separation of the sensitive and horny laminae, and consequent disconnexion, and dislodgment backward and downward, of the coffin-bone. Such a termination as this it is that is to be dreaded in every attack of laminitis; for, once let descent of the coffin-bone take place, and the horse, if not rendered thereby entirely useless, becomes certainly valueless for any purpose for which a sound horse is required. This it is that renders it of the utmost consequence that our treatment for a seizure with acute laminitis should be of that prompt and energetic description which is most likely to check or subdue the disease at once; since, if this chance be suffered to go by without being taken due advantage of at the moment, our sufferer is as surely lost to all likelihood, if not of life, of after soundness and serviceability, as though we had from the beginning left him to his fate or put a pistol to his head.

THE PROGNOSIS of a disease so frequently destructive of life, or of that which makes life supportable, as acute laminitis, ought to be given with great caution and consideration. Supposing we are called in to attend the sufferer from the very beginning of his ailments, when asked the question as to his probable fate—which we are sure to be—it must be represented by us, that no opinion can be ventured thereon in this



incipient stage. But should our calling-in be late—not until symptoms be making their appearance denotive of an unfavorable termination, such as separation of the laminæ, sinking of the sole, suppuratation, &c. ;—or should the symptoms be raging with unabated violence, and the period for a crisis—the third or fourth day—be past, we may not hesitate to pronounce unfavorably of the case. In fact, when the sufferings of the patient are extreme, and from every appearance the case is likely to terminate in death, either from irritation or mortification, or in such disorganization of the component parts of the foot as must inevitably render the horse a cripple for life, it often becomes an act both of humanity and expediency to slaughter or shoot him. For even should he, poor creature ! last out all his agony and trouble, he survives but to become, for the end of his days, an useless, or almost an useless, and consequently unprofitable servant to his master.

THE TREATMENT OF ACUTE LAMINITIS, undertaken with impressions on the prescriber's mind such as have been just depicted, will not lack either promptitude of action or boldness and decision of purpose. The patient stands before us loudly calling by his complaints for relief, and we feel conscious in our own mind, that, unless we can and do relieve him early and effectually either his life or his limbs must pay the forfeit. In setting about his treatment a good deal must depend, as to the immediate steps to be taken, on the stage of disease we find the patient in. If it be possible to move him from the stall he is standing in—regarding that to be an unfit one for him—a roomy loose box, where persons can get readily at and about him, and he himself can lie down and stretch himself at full length, is, beyond all others, the best place. We may also bear in mind, should we have any choice of abode for him, that it is possible we may have a desire at some stage of his illness to put him into slings ; though, for my own part, I cannot say I have ever experienced ultimate benefit, or any but very temporary relief, from such a proceeding. The next thing to be done is, if practicable, to take the shoes off the inflamed feet, in order to relieve them from all constriction. I say, “if practicable ;” because every now and then, when the patient is found standing, the pain of bearing the weight



upon one foot while the opposite one is being lifted up by the farrier, is so insupportable that he is unable to continue it even long enough to have his shoe wrenched off. Under these circumstances, some practitioners advise that the shoes be left on: indeed, some there are that consider such an act as unshoeing either as quite unnecessary or positively injurious. One point in the matter is certain, and that is, if the shoes are to be taken off, it ought to be done at the very commencement of the attack, since the difficulty will be certain to increase the longer the operation be deferred.

And when the shoes are being moved is the time to have the clefts of the frogs pared out to receive the setons I am going to propose; also, to have the soles of the hoofs pared and thinned, as well as we are able: though even here different practices prevail; since some persons contend that the soles should be *left strong*, whereby, they say, the coffin-bone is maintained in its place. This to me, however, is taking an erroneous view of the pathology of the case. For the detachment of the coffin-bone does not depend upon want of support from below—though it is possible such may delay for a time its actual descent; yet must the descent of the bone necessarily follow the separation of the sensitive from the horny laminæ, nor can any thickness of sole prevent this, no more than it can the ultimate bulge of its own body. D'Arboval recommends that the shoes the horse is wearing at the time of attack be taken off, to be tacked on again with four nails unriveted, or be replaced by others of a lighter description, should they be heavy or clumsy; alleging that by so doing he relieves the foot from all compression, and enables the horse to walk and stand, which he cannot with any ease do without shoes, and on that account is mostly found lying down. The sole, he adds, is so sensible in laminitis that it requires protection from pressure; and pressure does not pain when confined to the border of the wall. A serious objection, in my mind, to this practice is the hammering of feet in a state of inflammation, to say nothing of the known difficulty, in most cases, of shoeing the animal in such a condition.

Whether the shoes be taken off or not—and, for my own part, I am in favour of their removal—the next step in the

treatment to be taken is, in my opinion, the insertion of *frog-setons*. In short, I am, after no little experience in the matter, most decidedly an espouser of the plan of treatment so strongly recommended and deservedly extolled by Mr. Gabriel, in an admirable paper he sent to THE VETERINARIAN on the subject in the year 1844.\* The strong language used on that occasion, and which I do not think that gentleman has since had any reason to alter or retract, is in itself so expressive that I shall take the liberty here to transcribe it:—"The first and the only anxiety I have, on being called to a case of laminitis, is to ascertain whether or not disorganization has commenced: if it has, why then, of course, the mischief is irremediable; but if it has not,—and such will generally be the case, for the urgency of the symptoms is too great to allow of any neglect,—why, then, I feel perfectly easy as to the result, and I do not hesitate to predicate a favorable prognosis to the owner. I am now speaking of those cases in which the fore feet alone are affected, never having had one in which the hind feet, or all four, were suffering, under my own immediate care."

Mr. Gabriel goes on to inform us—"My first step, without the slightest loss of time or waiting for anything like preparation, is to give a full dose of physic—seven, eight, or nine drachms of Barbadoes aloes, as may be required—and then to put on the hobbles, and immediately *insert a seton through each frog*; thereby applying the safety-valves, which regulate the course of the disease. As soon as the patient is released, and has a little rallied from his punishment, I have recourse to a copious venesection from the jugular vein. Having noticed the state of the animal's condition, I place my finger on the pulse, and care not what quantity is taken, till it begins to falter; but, having produced that effect, I stop. It may be, that the abstraction of one, two or three gallons is requisite to produce this impression; but this impression I will have produced, and some intermediate quantity of the amount named will most generally do it. I then have his feet enveloped in large tepid bran poultices, order him to be comfortably clothed, to have plenty of chilled water and slop mashes, and then I consider he is fairly started on the high

\* 'Veterinarian,' vol. xvii, p. 142, et sequent.

road to safety. Should the symptoms become more urgent, bleed largely again the next day: and should not the physic be operating in twenty-four hours, lose no time, but go on with smaller doses till their full effect is produced; fever medicine may then be substituted, and given two or three times a day. Within twenty-four or thirty six, or say, if you will, forty-eight hours, his physic will be operating and his setons discharging; and having produced these effects, you have as effectually secured your patient against separation of the laminae and sinking of the soles as if no disease whatever had existed. Nothing can be more pleasant than the feeling of confidence with which each morning, when the poultices are being changed and the setons dressed, you tell the groom to pick out his feet and examine the soles. 'All right, sir.' 'What! no dropping?' 'Not a bit of it, sir,' is the certain reply.—In the course of five or six days, if the case is progressing favorably, leave off your poultices, and have the feet stopped up—supposing the shoes to be on—dressing your setons daily for ten days or a fortnight. A striking peculiarity in the discharge from the setons, occasionally, is its extreme fetid character. Imagine the worst thrush you ever put your nose near; it is a perfect nosegay to this discharge."

We have but one or two suggestions to make touching these excellent directions. The "*full* dose of physic" directed to be given at once, and without "anything like preparation," is absolutely necessary from the circumstance of the patient being unable to take exercise to work it off, and from the consequence it is to his future welfare that *full* purgation should become as early as possible established. Mr. Gabriel bleeds from the jugular vein. Would not the plat veins be preferable, as affording, in some measure, a topical as well as constitutional depletion? Mr. Castley mentions a case in which he opened "both cephalic (plat) veins at the same time." After the loss of seven or eight, or perhaps more, quarts of blood, coming rapidly away, the horse began to break out in a sweat, breathe hard and stagger. He was standing in a warm bath, out of which he was immediately taken and pinned up. "Next morning the animal was found standing upon his feet, apparently free from pain; and he got rapidly well again."\*

\* 'Veterinarian,' vol. iii, p 203.

poultices should be applied as hot as can be borne ; and instead of being composed of bran only, are sometimes made up in part of linseed meal, which makes them more retentive of heat and moisture. Mr. Gloag has informed me, he uses with excellent effect boiled linseed and turnips mashed together. Whatever ingredient be employed, it is advisable to wet the poultices from time to time by dipping them in hot water or pouring the water over them. But I recommend that fresh poultices be applied every morning and evening. The pediluvium or warm bath, as recommended by D'Arboval and some others, is almost impracticable should the horse be lying, and often very troublesome when he is standing, and, after all, not so effectual as poultices. If warm water is to be applied, the spongio-piline would afford the best medium for it.

Theorise and reason upon this mode of treatment as we will—and there is much in theory to be said for it, and something to be said against it—I am bound, by the results of my own trials of it, unhesitatingly to declare myself in its favour. In some cases it has seemed to work wonders ; but to this I feel myself constrained to add, in others it has as signally failed. Still, I have been vastly more successful practising Mr. Gabriel's treatment than with any other plan I have been wont to adopt ; and therefore I have, *quoad hoc*, every reason to be pleased and satisfied with it. Not that we are to feel ourselves precluded by it from introducing portions of any other practices in the treatment to which authority or experience has lent its recommendations, should we deem any such to be called for.

In the cases in which disappointment has attended such treatment, I have often observed that the setons have failed to produce the suppurative action usually consequent on their employment. Instead of being soiled with purulent matter, emitting the offensive odour so strongly remarked on by Mr. Gabriel, they have remained dry and odourless. There seemed too high or too extensive inflammation to permit the secretion of pus ; and it became a question, under such circumstances, whether, instead of proving beneficial, our setons had not been productive of harm by creating fresh irritation and inducing more blood to the foot, and thereby adding to that—viz., the inflammation—of which there existed already too



much? In such a case as this, and especially when we have already drawn blood from the system to the extent that we dare do, we naturally seek for some local abstraction of blood from the feet. And then the question arises, whether the punctures inflicted on parts in a state of inflammation to draw blood, do not tend to irritate and aggravate more than the frog-setons; considering that the one is run through parts away from the immediate seat of the inflammation, while the other penetrates the inflamed tissues themselves? Added to which, the wound we inflict at the toe of the foot is itself extremely likely to run into the suppurative action, and so may dispose the laminae to the same process; an event of all others, most to be guarded against. Mr. Castley, when he was serving in the peninsular campaign, found that, although he could relieve cases of laminitis, in the first instance, by bleeding at the toe, "yet in the warm climate of Portugal, I (he says) was liable to lose my patient, afterwards, in consequence of the wound that I had made in the foot. *Suppuration would be apt to take place in the sole*; secondary inflammation would be set up; and this would be followed by tumefaction, burrowing up and bursting all round the coronet; and then the game was lost. (The consequence being, the casting of the hoof.) I therefore abandoned the foot altogether, and began to bleed higher up." D'Arboval strongly expresses his fears that the toe yields *trop peu de sang* to directly relieve the sanguiferous system of the foot: such, however, can only arise from imperfect operation.

Those who object to stabbing the inflamed tissues may open the pastern veins, or, as D'Arboval suggests, in case swelling should oppose this, they may open the superficial coronary artery in front of the coronet. I have often myself had recourse to the plat vein, choosing this vessel in preference to the jugular; and through it have been enabled to make an impression on the foot at the same time that I made an impression on the system, selecting that limb for the operation which appeared in the greatest pain. Sometimes a great deal of blood is drawn by the punctures of the setons, and when such is the case there will, of course, be less necessity for seeking for other sources of local bloodletting. Should the



coronets be hot and painful, D'Arboval advises that they be freely scarified, the scarifications being made in the direction of the axis of the limb, and the bleeding encouraged as much as possible by immersion of the feet in warm water, or in poultices. This I regard as a practice likely to prove in urgent cases highly beneficial. Should there be any apprehension of too much blood being lost, the feet, he says, may be plunged into cold water.

In lieu of the mode of treatment which I have been here recommending, by some veterinarians a totally opposite course is pursued. Instead of warm and soothing applications, they make use of cold and repellant ones; they endeavour to repel or drive away the inflammation, alleging that the treatment adopted by us has a tendency to induce the suppurative action, the very thing it is our duty to avoid. For this purpose, constant supplies of the coldest water, tying the horse up in a stream of water, applications of pounded ice or snow to the feet, should either be attainable, &c., are various methods in practice for the agency of cold; and, no doubt, they have in many cases proved effectual: though, in my opinion, they are not a class of remedies to be adopted for choice, but only under circumstances of convenience or necessity. I have, before now, all but benumbed and paralysed the feet by the use of ice; but without that beneficial effect which, considering our grand object to be resolution, some might expect from it: nay, indeed, sometimes I have felt quite convinced that such extreme cold has provoked mortification.

After we have drawn as much blood as we dare from the system, and have followed up by topical bloodletting; and after the physic has worked well, and we have paid all due attention to the setons with the warm applications, or to the cold practice without setons, to the feet, and still the animal continues suffering keenly and cruelly, we are induced to make trial of another class of remedies, to endeavour to assuage or stifle the poor sufferer's pains. Some practitioners—among whom, as we have seen, stands Mr. Gabriel—succeed the copious evacuation of the bowels by *fever medicine*; others have recourse to *narcotics*. I must confess, my own experience in this part of the treatment has not yielded much in favour of

either of these modes of allaying fever and pain. Feeling that the source and seat of the pain is the foot, I have been in the habit of directing my therapeutic measures to the relief of that, with but little regard—perhaps not so much as I ought to have had—for the nervous commotion and sympathetic suffering set up in the system. I therefore hear with pleasure practitioners asserting, that ether and opium and belladonna are so many useful remedies for this purpose, and consequently demand to be used at this stage of our proceedings. Ether may be exhibited as the common fever drink; and digitalis may be given with nitre, &c., with similar febrifuge intentions; though, for my own part, I should have more reliance upon the former than the latter remedy. If I gave opium, I would administer it in a solid form and in full doses, say a couple of drachms or more, once or twice in the course of the twenty-four hours. Belladonna is a great favorite with some veterinarians of the modern school. The extract they tell us, may be exhibited in one or two-drachm doses two or three times a day with signal advantage.

In regard to any further applications to the feet, so long as the disease continues to advance or remains painful, we must persist in the use of such means—in particular of the poultices—as will be most likely to create and encourage discharge from the setons; which must, as directed by Mr. Gabriel, be kept running for some days after even the poultices have been discontinued. Should the case, as is likely to happen—at this period run into a chronic form, topical remedies of another class may be called for, besides attention to the feet, to the shoes, &c., all of which will come under notice when *sub-acute* laminitis shall come to be considered.

In January, 1837, Professor Ferdinando de Nanzio, Director of the Veterinary College at Naples, who was at the time on a visit to this country, laid before the Veterinary Medical Association, at our Veterinary College, a paper on the subject before us, developing a novel, and what appeared in my eyes a strange, plan of treatment for laminitis; a plan, indeed, which entertaining notions such as in these pages have been laid down, could be viewed at the time by me in no other light than as the unseemly and incongruous application of the

mechanical art to veterinary therapeutics; nor has trial of it by me been followed by such results as serve to bring it, in my mind, anywise into favour. However, it is not my desire, by any pre-expressed opinions of my own, to throw cold water on that which the Professor himself has described in such terms of confidence and commendation as to leave little doubt but many others besides myself have put the "new method" to the test. I shall therefore submit his paper, entire, to my readers in the translated form in which I find it in THE VETERINARIAN.\*

PROFESSOR DE NANZIO'S "NEW METHOD OF CURE" is, in that volume, introduced to our notice and described as follows:

"Inflammation of the laminæ is a disease very common among Neapolitan horses. It is inflammation of the reticular tissue of the foot, called by Professor Vatel *podophyllite*.

"In this disease it is absolutely necessary to procure *resolution*, because the other terminations are more or less destructive of the future health and utility of the foot. The reticular tissue is here engorged, and has a tendency still more to dilate—phenomena which are observable in every vascular inflammation, when there is an augmentation of the volume of the part.

"The reticular tissue of the foot, finding itself compressed between the crust and the bone of the foot, can be dilated only towards the coronet, or more frequently towards the sole. In these parts we observe suppurations, infiltrations, &c., which often compel us to abandon the treatment of the disease, and to destroy the animal.

"In this inflammation, cold baths, bleeding, and all other known means of cure, usually fail in producing resolution.

"Having constantly observed that horses affected with this malady are, to a certain degree, relieved every time they are shod, and do better when they are made to stand on hard pavement, and without straw, than when they are treated in an opposite way, I was led to make use of very strong compression of the hoof. As soon as a horse is attacked with this disease, I put on him a flat-soled shoe, fastened with four or five nails. Before fixing this plate, in order that the pressure may bear on the whole of the surface, I cause every part of the

\* Vol. x, at pp. 68-9 of the 'Proceedings of the Vet. Med. Association.'

space between it and the sole to be perfectly filled with pledgets of tow dipped in equal parts of vinegar and water.

“The plate, which is bent upwards posteriorly, has two holes in the curved portion, which serve for the attachment of a band that surrounds the coronet, and compresses it strongly in every part, and somewhat above and below it. I maintain a low diet, apply cold lotions, and I bleed whenever the inflammation becomes intense. After some days the animal is usually perfectly cured, and the covering of the foot may be removed.

“This compression may also be used after bleeding at the toe. I have nothing more to do than to recommend this method of treatment, which I have employed during many years, and always with the happiest results. It also proves the great success which might be obtained from the use of compression in the treatment of a multitude of enlargements of this nature.

“In the course of the debate it was elicited from the Professor, that he never touched the bottom of the foot with a knife—that the object of the encircling of the coronet with a band was to compress the blood-vessels, and cut off, as much as possible, the access of arterial blood to the foot—that usually a cure was effected in seven or eight days, and that in very few cases was it necessary to continue the compression beyond the fourteenth day. The horse, from the time of the application of the bandage, exhibited little or no pain, and walked in the usual manner. He confessed that he should not have recourse to this mode of treatment in cases of pumice foot, nor when there was a metastasis of inflammation from some other part to the foot. It was principally advisable at the commencement of the inflammation of the foot.

“He considered the two chief causes of inflammation of the foot to be of a totally opposite nature; it was the consequence of excessive work, and of standing too long in the stable and then being suddenly put to hard work. It frequently attacked the feet of horses after a long voyage, and it was often the result of bad shoeing. He usually bled from the toe; and in bad cases he always bled before the application of the compress. After this bleeding he turned the animal out, if convenient, into a pasture bearing long and damp grass, or he kept the

foot wet with water. On other occasions, and in paring out the foot, he used the same kind of drawing-knife that is so much in request in England."

#### SUB-ACUTE LAMINITIS.

THE few writers who have noticed this form or variety of disease, as well, I believe, as most veterinary practitioners who acknowledge its existence, denominate it *chronic*; a denomination I should feel very unwilling to disturb, did I not find it used in senses so dissimilar as to render the true meaning of the term, or that which is intended to be meant by it, at times doubtful. Now and then *chronic* implies the stage of comparative inaction which laminitis, whether it be *acute* or *sub-acute*, in its progress so commonly runs into; at other times, it is used to denote the form of disease we are now about to consider, viz. sub-acute laminitis. All this is ambiguous and confounding. In my opinion—and upon this I shall act here—chronic laminitis is but *secondary*—but a stage or sequel of one or other of the primary forms of the disease; whereas, sub-acute laminitis is an original affection as well as the acute, in relation to which it may be looked upon as a distinct species or variety. According to these views, it is evident that either acute or sub-acute laminitis may end in chronic, but that the acute cannot terminate in the sub-acute disease.

CHARACTERISTIC DIFFERENCES EXIST BETWEEN ACUTE AND SUB-ACUTE LAMINITIS. In neither form is laminitis the disease of the unbroke or unused horse. Now and then, acute laminitis will appear in the four or five-year-old horse fresh taken into work; more commonly it is seen attacking the horse while he is at work, at the middle period of his life. Sub-acute laminitis, on the other hand, is very apt to select for its subject the aged and worked horse. 2dly. Acute laminitis is the direct and immediate effect of work, hard either from its distressful character or from its endurance: sub-acute, on the contrary, will make its appearance in the stable after the horse has been for some time living in a state of idleness, or indeed absolute rest. 3dly. The former makes its attack directly and immediately, or shortly after, the application of the ex-



citant ; whereas the sub-acute disease approaches so gradually and stealthily that it is apt to be present some time before we discover its existence. 4thly. Acute laminitis is marked by great suffering and accompanying fever ; in the sub-acute there is nothing of the kind, the lameness being the leading symptom. 5thly. The termination of sub-acute laminitis is—supposing we do not succeed in bringing about resolution—pretty uniformly in sunk or pumice sole ; the disease rarely, in this subdued or mitigated form, ending in suppuration of the foot, and never in mortification.

SYMPTOMS.—Rarely does any complaint about this disease reach our ears until the lameness resulting from it is such as to render the further use of the horse either dangerous or impracticable ; by which time, as generally comes out in the subsequent history of the case, it has existed for some days, if not for some weeks. The first observation made concerning its presence is, that the horse does not in his trot step with his accustomed freedom and boldness, and that he flinches now and then in his tread, and stumbles. This is ascribed to shoeing, perhaps ; in fact, to any cause but the true one. For some time his work is still persisted in, notwithstanding he goes so gingerly upon his fore feet—in the groom's phrase, "*goes scramblingly*"—until at length he becomes unsafe either to ride or drive. This leads to his being brought to the veterinary surgeon. Examination into his fumbling gait shows that it is not the short pattering step *upon the toe*, with the continual break into the canter, of navicularthritic disease ; but, on the contrary, is the elongated projection of the limb, and measured and cautious setting down of the foot *upon the heel*, of laminitic disease. And this at once discloses the nature of the case. It is sub-acute inflammation of the laminae. And in confirmation of this, there will be, on nice examination of the hoofs, heat to be detected around the wall and upon the coronet : not to the degree present in acute laminitis, yet sufficient for the purpose of diagnosis. There will also probably at this stage of the disease be present some disposition in the walls of the hoofs, which are observably shelvy or rimmy, to fall in ; and the consequence of such failure in the wall will, to a greater or less extent, be sinking of the sole. These

latter symptoms in particular show the advance the disease has already made; at the same time that they throw no small discouragements in the way of the practitioner about to undertake the treatment of such a case.

TERMINATION.—By what has been stated, the ordinary termination of an attack of sub-acute laminitis has been anticipated. Usually, the disease, in spite of all we can do, tardily proceeds to produce effusion of coagulable lymph between the sensitive and horny laminæ, and this has the effect of detaching the coffin-bone from the hoof, leaving the latter to be forced down by the weight upon it, upon the horny sole, which sinks and bulges in the manner afore described. Along with this detachment and descent of the coffin-bone there would appear to be some extravasation or congestion of blood; for, when we lift up the foot and find the sole sunk, if the thumb be pressed upon the bulging part, a sense of fluctuation is imparted, leaving us to suppose that pus is collected underneath; whereas if, on such a supposition, the part should be punctured with a lancet, blood, and not matter, issues. Generally, there is no disposition to suppuration; nor, as was observed before, does this mitigated form of inflammation run into mortification. At the same time, let it be remembered that effusion is as well the termination of acute as of sub-acute laminitis; the only difference being, that this termination is more constant in the latter, and usually takes place abstractedly of the accompaniment of suppuration.

It would be altogether abhorrent to the vital operations of the body to suppose, that the descent of the coffin-bone should create a vacant space within the foot. No sooner is any interval in course of formation between the wall of the hoof and the coffin-bone than lymph is effused from the sensitive and secreting laminæ to fill it up, and thus such effusion becomes a solid medium of union between the horn and the bone; and, in the course of time, by degrees, changes take place in it, converting it, firstly, from lymph into a fibrous substance of the nature of cartilage, a sort of *callus*; and subsequently into fibro-horny substance, which as time elapses approaches nearer and nearer to the nature of horn; though it never, I believe, quite acquires the dense compact texture of the true wall of

the hoof, and on that account is to the latest period of life, generally at sight, distinguishable from it. This established deformity of foot it is that constitutes what is called *pumice sole*.

THE CAUSES OF SUB-ACUTE LAMINITIS are not always evident. There can be no doubt but that certain descriptions of feet, such as large and flat and weak feet, are from their conformation predisposed to the disease, on the same principle as they are to acute laminitis. As one sort of foot is predisposed to navicularthritic disease, so is another to disease of the laminae; and therefore it is that the excitant—which, in both instances is, in one comprehensive word, *work*—is likely to produce laminitis in one case, navicularthrititis in another, according as the foot to which it is applied be of this or that character. But acute laminitis is very often referrible to a distinct act of over-work or excessive exertion, which is rarely the case in the sub-acute affection. We certainly find the disease sometimes creeping on the horse while he is at work; but then, again, we find it come on him during the time that he is idle or even absolutely at rest. Within these few years past I have had in my practice two remarkable instances of this.

An old horse, three-parts-bred, who had done a great deal of work in the royal stables, and who, at the time he was growing stale upon his legs and feet, was presented by the Queen to Col. C., after having in the Colonel's service, as an occasional charger, done little else but taking daily walking exercise for the space of about three years, became attacked with sub-acute laminitis, first in one fore foot, then in the fellow one. The disease was subdued, but returned, and returned after this again; and in this way, after being from time to time combatted with and checked, ultimately ending in pumice feet, through which the horse was rendered unserviceable, and in consequence was destroyed. Another case of the kind occurred in Major B's. charger. This horse, during the time his master was on the continent, had been laid up, *alias* turned loose in a box without shoes on his feet, to do nothing. During this state of idleness he was attacked, in the same insidious manner in which the Colonel's horse had been, with sub-acute laminitis; for which, after being twice so far relieved and patched up as to be enabled to attempt his work so far as

walking for the space of a couple of miles or so (to do his guard), he eventually became reduced to the same state—*pumice feet*—the former horse was, and met with the same fate.

DIAGNOSIS.—That the acute and sub-acute are different forms or varieties of laminitis has, I trust, been demonstrably pointed out: the one consisting in violent and destructive inflammation; the other in inflammation of much less intensity and force, and of insidious origin, though hardly less disorganizing termination. There exists that broad line of distinction between them, that we are under no apprehension in practice of mistaking one for the other. Neither is sub-acute laminitis, in its stealthy beginning and tardy process, likely to be confounded with navicularthrititis; since the circumstance of the horse in one disease stepping short and quick, and going upon the *toes*, while in the other he makes every effort, in his walk even as well as trot, to elongate his step so that his feet may come to the ground upon his *heels*, will, along with collateral circumstances, be found sufficiently characteristic of the two diseases.

THE TREATMENT OF SUB-ACUTE LAMINITIS is ever undertaken with more or less disadvantage, from the circumstance of the disease, in the majority of cases, having got the start of the practitioner; inasmuch as, on inquiry, it will prove, in all probability, to have been already for some time in existence. This, together with its peculiar character, will render the treatment different in some important respects from that which we find most effectual in the acute disease. Having to deal with an inflammatory action of but a moderate intensity, though of insidious and stubborn character, we in vain make attempts to suddenly arrest it or cut it short by large blood-lettings, such as affect the system. In acute laminitis, wherein fever runs so painfully high, lowering the system is an excellent practice; but not so in the sub-acute affection, where there is no fever, and where the inflammation is of a character little more to be repelled by a constitutional than by a topical bloodletting; and, after either one or the other, will be pretty certain to relapse. Under these circumstances, we find local abstraction of blood, and repetitions of it, to be in the end

more effectual than one or two large depletions ; while it is unattended with the disadvantage of depressing the system to no good purpose, and the advantage of bearing frequent repetition. Blood may be taken in moderate quantities from the plat veins ; though it would be better to draw it more directly from the foot or feet. My practice consists in inserting *frog-setons*, the same as I would for acute laminitis ; and not, until this has been done, determining on the further abstraction of blood from the foot. For sometimes, as I said on a former occasion, considerable hæmorrhage follows this operation, and then further bloodletting, for a time at least, is not required. But should no amount of blood escape from the setons, one or both, in the foot which has not bled much I open the artery at the toe : the pastern veins affording too small an issue in general to invite having recourse to them. These topical abstractions should be persevered in every second or third day, according to the requirements of the case. And warm poultices applied upon the feet, of the same description as has been already recommended, in order to produce and encourage suppuration in the setons. Nor must we neglect to give a strong purge ; which here, as in the acute, ought to be administered on the first commencement of the treatment. I do not approve at this early stage of blistering the coronets ; though at a later period, blisters applied to the pasterns, including the fetlocks as well, often prove of signal service.

As soon as suppurative action is established in the setons, and they have continued for a couple of weeks or so to run freely, and the horse appears amending, we may withdraw them, and substitute cold and bracing applications for the poultices. Covering the hoofs with padded swabs, or compelling the horse to stand for some three or four hours daily in a bed of wet clay, made in a spare stall for him, will be found very beneficial, so long as there is any heat remaining in the feet. So soon, however, as he begins to step without evincing much tenderness, the best practice is at once to put broad-web shoes upon his feet, and cover the soles either with leather or gutta percha, interposing between that and the sole the common foot-stopping plastered upon tow, as is more particularly described in the treatment recommended for pumice feet.



## PUMICE FOOT.

By whom or on what occasion the condition of foot I am about to enter on the description of what was first called *pumice*, I have not been able satisfactorily to make out. Looking at the meaning attached to the word in our dictionaries—which is *spume* or *froth*—and applying this in the sense apparently the most natural to the case before us, it would seem as though *pumice* were intended to designate the matters which had to appearance been ejected or *spued* forth out of the horny case, such matters being sometimes covered with *spume* or froth, and from that circumstance, like pumice-stone, having a porous aspect. Therefore, a *pumice foot*—or, as Blaine has it, a *pumiced* foot—denotes, in the strict sense of the word, no less than actual protrusion of the toe of the coffin-bone, with its covering of sensitive sole, through the horny sole; though it is used also to signify that bulge and convexity of the latter which is preliminary to its rupture, and the consequent protrusion of the soft parts.

THE PATHOLOGY OF PUMICE SOLE amounts to this:—In consequence of inflammation in them, be that inflammation acute or sub-acute, the sensitive laminae, from causes which have already been detailed,\* become detached from their union with the horny laminae; and the coffin-bone, losing its ties of suspension, is pressed down by the weight upon the horny sole, which, unable to bear the burden thus unnaturally transmitted to it, bulges, and either immediately or some short time afterwards bursts, and lets the toe of the coffin-bone, with its covering of sensitive sole, through its breach. This, and this state of foot alone, it is, either actually present or impending, which properly constitutes *pumice foot*. Flat feet, nay, even convex and fleshy soles, do not of themselves amount to *pumice*; but, on the contrary, may exist independently of it. They may be, and are, dependent upon altered states of the hoof alone; whereas pumice foot consists in disorganization of the interior economy of the foot;—in altered structure and relative situation of the parts within the hoof, and in partial escape of them out of the hoof.

\* At pages 406, 407, under "Pathology of Laminitis;" and 420, 421.

PUMICE SOLE CAN HAVE BUT ONE ORIGIN.—Its existence is demonstrative proof either of the presence or of the pre-existence of laminitis, in the acute or sub-acute form. Those dove-tailed and intimate bonds of union between the sensitive and horny laminae which hardly any amount of mechanical force can, *in situ*, rend asunder, gradually loose their hold under the action of inflammation, and let the coffin-bone down upon the horny sole. This, as we have seen, may result either from acute or sub-acute laminitis, but with these notable differences :—That, whereas under acute inflammation pumice foot is rapid, sometimes sudden, always decided in its occurrence ; under sub-acute inflammation its approach is tardy and stealthy, and for some time doubtful and indeterminable. Indeed, in the latter it often happens that the sinking of the sole is the first intimation we obtain of the presence of the disease. The horse may have been observed to step short or gingerly, compared to his usual style of going, and this is succeeded by tenderness of tread to that degree that continuance at work becomes impossible, under which circumstance we are called to examine his feet, and to the surprise, probably, of the owner, find the soles either actually sunk or showing unmistakeable signs of sinking. Pumice sole resulting from acute laminitis is, as we have seen, though at all times a lamentable affair, a more complicated and serious one still, from its so frequently having suppuration of the foot as an accompaniment ; and when this proves to be the case, all prospect of remedy may be said to be at an end. It is not so, however, in the case wherein pumice foot follows a sub-acute or low kind of inflammation. Here there is not the tendency to suppuration, but rather to adhesive action ; and this it is that on occasions invites us to take the case under treatment ; and now and then we succeed in restoring the integrity of the breach and soundness of the sole. But this, I am reluctantly forced to add, is but a rare issue compared with the states of pumice sole which defy our art at effecting such restoration of them as will render the feet again useful for work.

THE TREATMENT OF PUMICE SOLE—when the case happens to be of such a nature as to inspire us with hope through judicious and careful management of it—obviously presents to us two objects for consideration : the first being, the healing of

the wound and closing of the breach in the sole to which it owes its existence ; the second, the elevation of the coffin-bone, and its adjustment, as far as we can, in its natural *position*. I say “position,” for as to forcing up the bone into its proper place again, of course that is a matter entirely out of the range of possibility. When once complete separation of the laminae has taken place, no power we possess can restore their union ; indeed, no means can be used to carry into effect so much as we may be able to accomplish towards the raising up of the bone before we have completely restored the integrity of the sole, and made the part where the breach existed sound and firm, and able without pain to bear pressure.

FOR THE HEALING OF THE WOUND, the continued application of poultices will be found beneficial so long as any annoying inflammatory action is lurking about the foot, and so long as the wound itself puts on a healthy aspect, and seems disposed to granulate, or actually is granulating. But whenever such is not its character, and particularly when its surface looks pallid, and the circulation through it appears languid, stimulating and escharotic dressings ought to be substituted for the poultices.

OF THE VARIOUS KINDS OF DRESSINGS in ordinary use for the purpose of promoting the healing of footwounds and their subsequent coating by a sound secretion of horn, none are found to answer well unless they be, through some suitable contrivance, firmly bound upon the ulcerated surface, so as to give as much *pressure* to it as the animal can bear. Pressure to the extent of producing pain is injurious ; but the utmost degree short of this is uniformly found to be attended with the happiest effects. In short, without concomitant pressure, the most extolled dressings will seldom prove of much avail. If the hoof be cool, and it is considered that a light shoe can be worn without hurt, providing it be put on with small nails driven through parts of the crust able to bear the concussion of the hammer and to hold such nails, great advantage will be derived from it, inasmuch as it will afford very convenient means for employing the degree of pressure found so salutary and effectual. This is to be managed by obtaining two or more pieces of iron hoofing, cut into lengths to admit of being

placed, diagonally, across the sole, and of being confined in that situation through their ends being driven, for stays, between the web of the shoe and the sole. They should be so placed as to cross each other opposite to the part where the dressing is, that being previously covered with as many thicknesses of tow as become requisite for the necessary pressure. After the hoop-iron stays are arranged so as to give firm and steady support to the tow underneath them, they may be, at the point of crossing, well hammered down upon the foot; an operation which will serve to accommodate them more completely to their situation, at the same time that it conduces to give additional pressure, which will be maintained when the foot comes to be set upon the ground by the standing of the horse upon the compressed dressing.

In regard to the best medicament to apply, providing the exposed parts of the sensitive sole be—as they commonly are—in a healthy condition, stimulating applications agree well, and no one in the class exceeds in efficacy the *ol. terebinthinæ*. This, under the influence of pressure, will generally of itself bring about all we desire; though, should any change of dressing be deemed desirable, we may use either *tinct. benzoin. cō.*, or *tinct. myrrhæ cō.* Should any signs of unhealthiness or malignancy—a rare occurrence—make their appearance, escharotic stimulants, such as solutions of copper and zinc, and even of mercury, might be employed. An astringent, such as solution of alum, or a detergent in the form of chloride of lime, may also occasionally be required.

Having succeeded in healing the wound and causing the breach to be covered over with sound though soft horn, a dossil of dry tow well pressed down will be all that will be further needed to keep the dirt and wet from the parts, and to harden and prepare them for being finally *stopped*, and, thereby protected from injury, when the horse shall be permitted to take exercise or go to work. The new-formed sole being now sound and tolerably firm and hard, should a shoe have not been nailed on the foot before, now is the time for one to be put on. And the shoe best for such a description of foot is that which will, either of itself or through additions made to it, enable us to give that amount of pressure upon the sole which

is found to be so requisite for the purposes of support and uplifting of the descended coffin-bone to the extent possible, into some proximity to its original place. Whether we really possess any such power as will effect this, may very properly be made the subject of doubt; but that we can, by pressure and support to the sole, prevent any further descent of it, should that appear likely to happen, is beyond a question. A broad-web shoe—such a one as Plomley's of Maidstone\*—is a good one for this purpose; and this should be plugged internally with stopping, intermingled with tow, the two together forming a compressible pillow, upon which reposes with ease and firmness the as yet tender sole of the foot. Over the stopping and tow should be placed, and nailed on with the shoe, a stiff piece of sole leather. Or, which some prefer, after the shoe is nailed on, a piece of gutta percha, cut of smaller size than the circumference of the shoe, may, after being softened in hot water, be kneaded in upon the sole, over the stopping, with the thumb, and pressed around the edge sufficiently underneath the web of the shoe to maintain its hold. With his foot thus shod and cushioned and protected, the horse may return gradually to hard work.

Instead of the broad-web heavy shoe, it may be advisable, in a case where the foot is thin of horn and the crust apt to break away, to substitute a shoe as light as it can be made consistent with its purpose. A shoe made narrow but *thick* in the web will sometimes be found to answer very well when used in conjunction with leather or gutta percha in the manner before directed, such a shoe possessing the advantage of being held on by smaller and fewer nails than what the broad shoe requires. And whenever we meet with a foot of such description, with thin and weak or brittle crust, we are not to be particular as to either the number of the nails used to keep the shoe on or the situations they occupy through the hoof; for sometimes it becomes necessary to nail the shoe all round in order to fix it firmly for work, and to make use for the purpose of double or even of triple the number of (small) nails we ordinarily insert. In fact, if the horse is to go to work in

\* See 'The Veterinarian,' vol. xxiii, p. 315.



it, the shoe must be secured at any multiplicity and variety of nailing, and clipping in addition, save that of doing positive injury to the foot.

## FRUSH.

ETYMOLOGY, supported by primitive\* and the best modern† usage, is my authority for giving this orthography to what is, in these our days, commonly spelt *thrush*. Custom may be urged as a forcible reason for even continuing in literal error, and it is at all times an awkward power to make war against ; at the same time, I think it behoves us to rid our nomenclature of as much of the false orthography which has crept into it as possible, and particularly when we come to be warned of such error by our own lexicographers.‡ The derivation of the word *frush* is a matter which has been so learnedly discussed by Bracy Clark, in his “Essay on Running Frush,” that I shall avail myself of the opportunity on the present occasion, since it appears a question of some importance to settle, of translating the passage treating thereon into these pages :—

“The term *Frush* is originally derived from the Latin *Furca*, signifying a fork ; but probably comes more immediately to us from the French word *Fourche*, also signifying the same thing ; and its derivative, *Fourchette*, is the appellation, in this language, of the frog at this day. Hence formerly we obtained *Running Fourche*, and by an easy transition, *Running Frush*, which word actually occurs in our English writers, as in Blundeville and De Grey, and others, and *is therefore the true word.*”

FRUSH IS SO NOTORIOUS, that any horseman would run a risk of being accused of unpardonable ignorance who should confess to any lack of knowledge concerning it ; and yet, as a veterinary writer, I find it to be a subject calling for a somewhat extended consideration. So common is frush, that, if ever there was a disease that could be called universal among horses, this may be said to be the one. Everybody's horse has a frush, and yet nobody appears to be concerned about

\* Blundeville, De Grey, Solleysel, &c.

† Bracy Clark.

‡ Richardson's ‘New Dictionary of the English Language.’

the matter. Horses, in general, seem to go as well with frushes as without them; hence the reason of so little or no notice being taken of their presence: added to which, the circumstance affords a pretty convincing proof that the judge in a court of law, who, in former times, pronounced frush to constitute unsoundness, erred most egregiously in his *fiat justitia*.

A FRUSH IS NOT TO BE ACCOUNTED UNSOUNDNESS unless it produces lameness, which it rarely does. A horse having an ordinary frush will go as far, and as well—save that he may perhaps at times “drop” from treading upon a stone—as one whose frogs are in a normal condition; and therefore cannot in reason be regarded as unsound. And besides, were a frush to be viewed as unsoundness, there would be found perhaps more unsound than sound horses in the country; in fact, according to such a notion, hardly anybody would possess a sound horse. But

FRUSHES ARE NOT SO COMMON NOW-A-DAYS AS THEY WERE some years ago. This is one of the fruits of an improved practice of shoeing; though so long as shoeing shall exist in anything like its present form, supposing there were no other cause for the disease, we should still have frushes. Constituted as the frog is, both as regards its own structure and its relation to other parts of the foot, it is quite impossible it can, in the state of constriction in which the whole foot is held by the shoe, perform to the full its natural functions; and being unable to do so, the hoof gradually contracts and shrinks, in spite of every contrivance through shoeing to prevent it; and though, by very good management on the part of the smith, and little proneness to such affection on the part of the foot, frushes are in some instances kept aloof, the frog is still too apt to become, in the course of time, a shrunk, sharp, narrow body, meanly comparable to what it, in the colt's foot, originally was. The observation of this fact it is that has led to the development of one of the

CAUSES OF FRUSH, and that, too, the most general one. The frog was given to the foot for important purposes; and Nature has so ordained in this, as in all other organised bodies, that unless those purposes be fully carried out, it cannot maintain

its original state of development. Diminished function entails diminished form; the same volume of structure is found no longer to be required; the body falls away under the decrease of demand upon it; and in the end becomes "beautifully less," or else actually diseased. The late Professor Coleman's mind was fully alive to all this. He argued, that the frog, being made to bear pressure, must receive it, or fall into a state of degeneracy and disease, pressure to the frog being a means of counteracting contraction. The most convincing and satisfactory proof we can have of the salutariness of pressure to the frog, is the state of the organ in those feet in which it has been exposed to pressure from tread upon the ground, contrasted with its condition in feet in which it has been removed out of the way of pressure. In the one case, the frog is bold and prominent and sound; in the other, shrunk and shrivelled and frushy. But something besides pressure is wanting to preserve the full normal state of the organ, as is shown by the frog in the natural or unshod foot, as compared with the frog of the foot that has been for some years shod, albeit upon the best of principles. The latter may have been all along maintained in a state of soundness, and yet it will not bear comparison with the former. This does not arise from lack of pressure to the frog, but from habitual constriction of the shoe upon the foot. Perhaps nothing more strikingly evinces the truth of this than the wearing of tips. With the heels left, as they are in tips, at liberty, at the same time that pressure is given to the frog to the uttermost, the organ is not only maintained full and perfect, but may, by such means, even after its degeneracy, be restored to its original normal condition of expansion. Light blood horses, with feet rather oval than circular, and that go near the ground, are most prone to contraction and frush. And when the frogs—of such horses especially—are pared away, as they are too apt injuriously to be by the smith, contraction both of frog and foot goes on with redoubled force, in consequence of the counter-operation of that body being entirely annihilated. Leaving the heels high when the horse is shod, or shoeing with thick or high-heeled shoes, has precisely the same effect: in fine, every mode of shoeing and paring the foot which, directly or indirectly, deprives the frog of its natural bearing and

pressure upon the ground, must be regarded as a predisposing cause of frush, contraction in such cases being the excitant. Not content with cutting away the frog, that they may give it a shape pleasing to their own eye, however injurious to the horses, farriers will very often, at the same time, what they call "clean out" the cleft. This means not merely removing any appearance of ruggedness and dirt there may be, but making a fresh or "clean" chasm in it, which must necessarily prove a harbour for more dirt, and probably will allow of its still deeper insinuation into the cleft, thus giving origin to irritation and frush. In addition to which I may mention, *en passant*, farriers have an offensive habit of grooving along the *sides* of the frogs, and often to that depth that grazes the sensitive parts, the consequence of which is the issue of a discharge afterwards from them not very dissimilar to frush.

HEAT OF STABLE, and perhaps *foulness of stable* as well, conduces to the production of frush; operating either through the general system, or, locally, on the foot or frog itself. Anything that will dispose to heat of foot, such as lack of moisture to the hoof, standing for hours together upon dry and heated litter in a hot atmosphere, or standing in dung and urine, may tend to produce this feverish state of foot; while, at the same time, the latter may exert some effect in irritating the frog itself. Coleman used to say, he could at any time create a frush in twenty-four hours, by putting on a high-heeled shoe, so as to raise the frog off the ground; and placing the horse at the same time in a hot and impure stable, where he would be standing all the while upon heated litter, saturated with dung, urine, &c. Here, it is evident, the Professor depended for the success of his experiment upon more agents than one. There were in simultaneous operation heat and non-pressure, both tending to contraction; and heat and moisture, and, it is probable, pestilential vapour from the horse's bed as well, to assist in the production of frush.

CONTINUED EXPOSURE TO WET AND DIRT, notwithstanding the frog be all the while subject to pressure—nay! the horse even be wearing tips at the time—will in many feet produce frush. Horses returning from low and marshy pasture, or from mucky strawyard, in the spring of the year, after having been

out all the winter, and particularly after a prevalence of wet weather, are extremely likely to return to their stables with frushes. In this case frush is caused by a softening and decay, and partial solution, of the horn of the cleft, whereby the sensitive structures become annoyed by the contact of wet and dirt, and in consequence take on anormal action. It is possible for frush to be engendered in the same manner within the stable, not only, as has already been mentioned, from horses continually standing for hours together with their hind feet in dung and urine, but from their fore feet being injudiciously over-much plastered with wet and irritating stopping, such as clay and cow-dung, &c.

BUT A FRUSH MAY HAVE A CONSTITUTIONAL CAUSE.—That which produces eruptive skins and swelled legs may produce frushes. Horses high fed, full of blood, and in fat, gross, and plethoric condition, and particularly young horses making flesh fast, will now and then be so disposed. Indeed, idle or laid-up horses in general may be said to have this propensity. Nor are such cases to be set right again without attention to the system—by giving physic, alteratives, &c., as well as to the feet.

SYMPTOMS.—Horse persons in general are so familiar with the appearance of frush that any description of symptoms seems almost superogatory. The cleft of the frog either simply exhibits a moisture, as though humidity exuded through the substance of the horn, and this moisture emits a peculiar noisome odour, especially recognised by the introduction of the finger into the cleft; or perhaps fluid may be made apparent by squeezing the frog and heels together, to cause it to exude from the cleft; or else the cleft itself is found in an actual state of raggedness and rottenness, issuing matter with stench, but too palpable, amid the ruins. When this is the case, farriers denominate it “a running frush.” At other times when the disease is farther advanced, and particularly when wet and dirt have been the cause of the frush, the entire cleft exhibits “a mass of corruption.” Nor does the disease now any longer confine its ravages to the cleft, but extends them throughout the substance of the frog; the matter insinuating itself between the fibres of the horn, under-running the



substance of the frog from heel to toe, and along the sides particularly, and so laying the foundation for complete destruction of the body. In the incipient stages of the disease the discharge is *ichorous*, *i. e.* thin, acrid, and serous in its nature; afterwards it turns to purulent matter, though by its colour it would rarely be recognised as such, owing to its being stained of a dingy, dark, or sooty hue, through the decaying horn, which becomes eroded by and partially dissolved in it. In the worst stages of frush, when large and open chasms of rottenness and corruption exist in the frogs, and there be many such horses standing together, the stench arising from their combined offensive odour is so great that the very atmosphere of the stable is contaminated by it; the smell thereof being perceptible that any person acquainted with it pronounces at once, on entering the stable, what is going on amiss there.

FRUSH AFFECTS THE HIND AS WELL AS THE FORE FEET, and in this circumstance differs from most other foot diseases. And the reason why it does so appears obvious, when we come to consider how much the hind frogs are apt to be raised off the ground by shoes with calkings, and how very much exposed the hind feet are, in stables in general, to wet and dirt from the excretions. Still, we more frequently find frushes in the fore than in the hind feet, owing to the application of causes occasioning contraction in them whose power is counteracted from exerting the same influence in the hind feet.

THE PATHOLOGY OF FRUSH will require for its explanation a reference to the physiology of the part affected, which we have found to be *the cleft of the sensitive frog*. This part of the foot receives into its cavity the obverse side of the cleft of the horny frog, a part to which Bracy Clark has given the name of *Frog-stay*; and the mortice sort of connexion thus subsisting between the sensitive foot and the horny hoof, while it operates in preventing any dislocation between them, at the same time admits of such motion between the one and the other as is requisite for the play or performance of the functions of their several respective parts during the time the animal is in action. But motion of no kind, however limited, can go on, especially between organized and inorganized parts, without lubrication of some sort; and this is, in the instance

in question, provided for by a peculiar sebaceous kind of secretion known to us more perhaps by peculiarity of odour than by any other property it may possess. This secretion naturally escapes through the pores of the horn into the cleft of the frog, where it becomes absorbed and disappears. Should it, however, from irritation or inflammation of the parts secreting it, become so redundant in quantity as to give rise to the appearance of moisture in the cleft, and perceptible smell likewise—and it never does so without undergoing at the same time alteration in quality—the discharge of it constitutes frush. Coleman used to compare this secretion to the exudation taking place between the toes of our own feet, to prevent them growing together; and, no doubt, some similar purpose is answered by it in the cleft; though I would rather make a comparison between the secretion in the axilla of man and that in the cleft of the frog, seeing that there is something in both instances beyond mere exposed superficies.

Bracy Clark has represented frush to be a fracture of the *frog-stay*; and has distinguished it into *natural* and *secondary* or *acquired*. “The frog-stay,” he says, “the last of the foot in obtaining its perfect growth and consolidation—being in some perfected at two years and a half, in others not until three and a half or four; and, if opposed by natural weakness or externally destructive agents of the horn, such as wet, dirt, urine, &c., *then the frog will never be properly closed*, and a frush will be the consequence *through life*.”\* In proof of which opinions being founded in fact, he gives an account of having visited some colts belonging to the East India Company at pasture near Epping Forest, and finding several among them with frushes: a circumstance plainly explicable in my mind by the “place where they were confined being,” as he himself states, “particularly wet.”

FRUSH IS ONLY ON RARE OCCASIONS ATTENDED WITH LAMENESS.—Horses having frushes—and the exceptions, in a general way, are not numerous—appear to go, and to do their work as well, with as without them: hence, the little or no attention paid to them, and the unscrupulousness with which one person

\* See his ‘Essay on Running Frush.’

sells or purchases a horse known to have frushes. Still, there are occasions on which lameness proceeds from frushes. A frushed horse may, at such times as he happens to step with his frog upon a stone, "drop." This, however, is but momentary, and probably occurs but rarely. Nothing is more likely to produce lameness from frushes than a sharp dressing. The horse is taken, perhaps, to be shod, going as well as usual; but returns quite lame or tender-footed. The farrier is discovered to have used some *sharp* dressing to his frushy frogs, and all is accounted for. Dealers are very fond of mentioning as a cause of lameness the existence of a frush should a horse they are selling happen to go lame or tender, when, all the while, they know or ought to know better. Frush in its worst stages will at times occasion lameness, and severe lameness too, simply from exposure to tread of the sensitive parts of the frog. As a general rule, however, frushes are not to be reckoned among the causes of lameness, and hence are not accounted as unsoundness.

THE TREATMENT OF FRUSH—supposing it be deemed requisite or worth while to adopt any treatment at all—is to be regarded in two points of view: either the horse is intended to continue his work the while, or he is suffered to be laid up as a patient. Hundreds and thousands of horses having frushes—running frushes—are doing their work as though their feet were perfectly sound, and no heed whatever is taken of them; save, perhaps, that some of them may have their frogs pared and "dressed" every time they happen to be fresh shod; though in general they derive little benefit therefrom, owing to the injudicious and clumsy manner in which such dressings are performed. A leading principle in the treatment of frush necessarily is, or ought to be, the restoration, to the extent we are able, of the frog's natural office, at the same time that we are eschewing all such causes as appear to have given rise to the disease. With a frog that has been raised off the ground so long that pressure to it can only be safely restored by degrees, we must rather have recourse to artificial means of pressure than think of lowering the heels all at once, much less of applying thin-heeled shoes or tips suddenly. Such a frog cannot bear pressure like this; though it will be much benefited by filling the vacancy between it and the ground when the shoe is on with tow and leather, or

gutta percha, or other soft and impressible material, which will not only sustain any dressing we may desire to apply, but give for a time the required pressure. Sometimes a bar-shoe can be borne very well, and will give the requisite support; where it cannot, cross-bars of iron hooping may be introduced underneath the web of a plain shoe to sustain any dressing we may desire to apply, and by dossils of tow upon the dressing to give pressure at the same time.

Coleman, many years ago, introduced what he called "patent frog-bars" for this purpose. And to a certain extent they answered; but they were found troublesome, from the nice application they required, and were too expensive for common use, and could not be worn for any very long time, or indeed very comfortably, owing to the constant and partial pressure they invariably made upon the frog. And pressure such as this was likely to be productive of harm instead of good, unless the heels of the hoof were set at liberty to yield to it. With the patent frog-bars this could not well be managed, owing to the number of nails required to keep the apparatus on the foot; though Coleman succeeded, in this respect, better afterwards by means of his frog-bar shoe. With the shoe in ordinary use—the *plain shoe*, as it is called—we must effect the object to the limited extent we are able, by carrying the nails, which ought to be as few as possible, as far as we can toward; though when we have leather and dressings as well to retain, even this measure of forward nailing is taken at a risk. Gutta percha has an advantage in this respect, inasmuch as it admits of being moulded, after being soaked in hot water, into the sole of the foot, after the sole is nailed on, and can be made to serve equally as well as leather for covering and protection. To narrow or contracted feet, with strong and deep heels, no shoe possesses half the virtue of a tip. Providing the frushy frog be, or through the means recommended be brought to be, able to bear the pressure from partial tread upon the ground, leaving the heels unpared down, and substituting a tip for the plain shoe, will really work wonders. Hardly any person who has not made trial of this plan would credit the reports I myself—in common with others—could make of it; I shall, therefore, not attempt any further eulogy of the tip here, but simply,



circumstances suiting, most strongly repeat my recommendation of it. In wet weather, the tipped horse ought, most assuredly, to be kept as much as possible out of wet; but in dry weather, and upon country roads, on such a foot as I have described, the tip will answer all the purposes of the plain shoe.

IN DRESSING FRUSHES some distinctions will, in general, require to be made between the horse intended afterwards to go to work and the one we can afford or obtain permission to lay up. In the former case, the state of the ground, wet or dry, will have something to do with it. In any case, little or no benefit can be expected to be derived from dressings superficially or imperfectly applied—applied by merely smearing over the ragged or rotten parts of the frush rather than insinuating them into the *seat* of the disease. For any permanent good to be done, the entire decayed or ragged covering of horn lining and filling the cleft must be scooped out and got rid of; all the *dead* horn, in fact, must be removed with the drawing-knife, and the living horn and deep-seated diseased sensitive parts of the cleft freely exposed; and then, but not till then, may we apply our dressings. To accomplish this, it may, indeed, in inveterate and *bad* frushes, become necessary to cut away the major part of the frog, or perhaps the whole of it, supposing it to be under-run, which is sometimes the case. Notwithstanding this, however, it is often in our power, in case of emergency or compulsion, to send such horses to work by bolstering their diseased frogs up with pledgets of tow, and defending them from wet and dirt by leathern or gutta-percha soles. In such a case, however, the same *sharp* dressing is hardly applicable which we would, perhaps, prefer applying to the frush of a horse in a similar state whom we had an opportunity of confining within doors. I should then, unscrupulously, apply a sharp dressing, such as the compound solution of sulphate of copper,\* or the chloride of antimony, or even undiluted nitric acid, according to the exigencies of the case. I know there is a feeling in the minds of grooms and farriers, and in those of some veterinarians too, against such “sharp” treatment; and I am not ashamed to confess I have felt, and

\* According to Mr. Morton's formula:—see his ‘Vet. Pharmacy.’



perhaps do still feel, at times, some hesitation at so acting. I have, somehow or other, imbibed this vulgar notion, or, as I believe it to be, “popular delusion,” and cannot altogether disencumber my mind of it; notwithstanding, I can with great force and truth say, that I never saw “inflamed eyes”—for they are said to be the seat of the apprehended metastasis—arise out of the arrest of the discharges from frushes; though I have many times witnessed, and indeed expect, in certain cases, inflammation of the foot and lameness from it after the first application of such acrid and caustic dressings: and therefore do I invariably take care to prepare the way by low diet and physic; and also, wherever such lameness does ensue, take pains to mitigate it all in my power by warm baths and poultices, and abstinence for some time to come from any repetition of such dressings, should they again be found needed.

Were I to set about to offer any list of the various medications, either in the shape of simples or compounds, which have at one time or another, and by one person and another, recommended and extolled for “the cure of frush,” I might, I verily believe, enumerate all the articles of the veterinary pharmacopeia, and the medical almost as well. Alum, nitre, calomel, chloride of lime, the oxides and sulphates of zinc, iron, copper, verdigris, sulphuric and nitric acids, hydrochloride of antimony, the spirituous tinctures, tar, &c., have all been called into requisition. Not that above one-tenth of them are really required; though frushes in general, like troublesome old ulcers, often do best under change and variety of dressing. A very old unguent, and I think—and I believe I shall be supported in my opinion—a very useful and efficacious dressing for frushes, and one of general application, is the following:—

Take of Verdigris.....	℥iss
Alum .....	℥ss
Vinegar.....	℥ss
Treacle.....	℥iv

The first two ingredients being separately powdered and subsequently mixed together, the vinegar is to be poured upon them, and afterwards the treacle, and the whole well stirred and

incorporated. The mixture is then to be simmered, for ten minutes, over a dull fire or in a water-bath, and kept constantly stirred the while it is simmering.

For ordinary frush, some simple dressing or this ointment—which is characteristically called *frush ointment*—will suffice. The latter is likewise an excellent resource after we have done the required execution with the escharotic applications. The grand considerations in the treatment of frush, after all, however, are, as I stated before, to look to the restoration of the functions of the frog, and to take special care to guard it from wet and dirt; since there are no greater enemies than these to the healing and well doing of all diseases of the secretory tissues of the foot. And these precautions are not only necessary during treatment, but become requisite to be continued for some time after cure, in order to ward off relapse: for relapse, in the case of long standing and habitual frush, is but too likely to happen. Nor does any measure we can put in practice more completely and wholesomely effect the principal of these objects, viz. the return of healthy action to the frog, anything like to the same degree as the shoeing with tips. It is really quite surprising what a salutary metamorphosis the contracted and frushed foot, or the foot that has been frushed, in a few months undergoes under the operation of tips. It no longer remains like the same foot; neither does it any longer possess the same liability to become disordered.\*

#### CANKER.

CANKER, in the sense in which we make use of the word in hippopathology, may be said to be synonymous with *cancer* in human medicine: the latter being the Latin name for a crab, an ill-favoured animal the disease in certain forms has been

\* It may be useful here to remark that the preferable mode of applying gutta percha as a substitute for a leathern sole is, by way of preparative, to warm the hoof first in hot water, and then to stick the softened gutta percha to the sole and frog by means of the "solution of gutta percha." The surfaces intended to adhere must previously be wiped quite dry.

supposed to resemble. For the same reason, cancer is sometimes called *lupus* or wolf. The French have named what we express by canker, *crapaud* or toad, seemingly from some such fanciful similitude.\*

DEFINITION.—Canker is a disease of the secreting tissues of the foot, affecting in particular the sensitive frog and sole, essentially consisting in the production of a peculiar morbid substance called *fungus*.

THE HISTORY OF CANKER, in our own country, while it affords most satisfactory results in regard to the contrasted prevalence and destructiveness of the disease in times past and in times present, opens to us a book of instruction out of which we may learn both how to prevent and to cure it. In former days it was no unusual thing for canker to prevail in large establishments of horses in an epidemic and even a malignant form. In the army, the disease was known to create year after year sad defalcations; nor were these prevented but by the introduction of veterinary surgeons into the several regiments and horse departments. I have heard both the late Professor Coleman and my father (who was the senior veterinary surgeon of Artillery) say, that, towards the close of the last century and the beginning of the present one, the annual losses to the cavalry and ordnance services, through canker and grease and glanders and periodic ophthalmia, were truly awful. Whereas, at the present day, army veterinary surgeons have it in their power proudly to boast, that such diseases are comparatively rare;—that some indeed are all but unknown to them: so unusual is it to meet even with a case of grease, and so much more uncommon—and not very creditable—is it to encounter one of canker. Nothing can set in a stronger or more satisfactory light than this the utility of veterinary surgeons in large horse establishments; showing, as the fact does, that their art is available no less in the cure than in the *prevention* of the disease.

\* Might not canker derive its application to this *fungous* disease from the meaning attached to the word in Gloucestershire, viz. its signifying “a poisonous *fungus* resembling a mushroom?”—‘Crabbe’s Johnson’s Dictionary.’

HORSES OF COARSE AND HEAVY BREED, and particularly those that have much hair upon their legs, and have broad and flat feet, are said to be most obnoxious to canker ; and I believe not without reason : at the same time I think it will appear, as we proceed in our inquiry, that, in situations where it is prevalent among them, the habits of such horses have much influence in the production of this disease.

THE HIND FEET ARE OFTENER AFFECTED than the fore. This, no doubt, arises from the situation they occupy, as compared with those of the fore feet, in the stall or stable. While the hind feet are all day long, or a great part of the day, exposed to wet, and that of a putrescent character, from the lodgments of dung and urine, and from that cause alone are apt to engender frush, something may be said of their increased liability to diseases in general, such as frush and canker and grease, in consequence of the greater distance they are removed from the centre of circulation.

THE SEAT OF CANKER, ordinarily, is the *frog* of the foot, and, as has been remarked already, the *hind* frog in particular. If, allowed, however, to progress, the disease is not long before it spreads from the frog to the sole of the foot. But frog and sole may both be in a state of disease, and yet the horse while standing before us, show no sign of ailment until his foot be lifted off the ground. From the sole, the disease, continuing to spread, extends around the circumference of the toe and quarters, at the place of junction of the laminæ with the sensitive sole ; and here it is that the fungous growths appear to flourish with a peculiar luxuriance ; which, we shall find, as we proceed, arises out of the nature of the tissues existing at this particular part. The fore feet are not often cankered without one or both of the hind participating in the disease. Nay, it not unfrequently happens that all four feet turn out affected ; and, when this is the case, it proves extremely difficult and tiresome to get quit of the disease, the healing of one foot being so apt to be followed by fresh eruption in another.

THE SYMPTOMS OF CANKER—in other words, the appearances presented by a foot in a state of canker—are at once peculiar and striking. The diseased foot assumes that strange loath-





## PLATE XIII.

### LAMINITIS OR FEVER IN THE FEET.

A longitudinal section has, in this Plate, been made of the near fore foot, from the fetlock downwards, of the Colonel's old charger, whose case is given in detail at page 421.

It will be observed that the coffin-bone (*a*), which, had it been in its normal or natural position would have lain slanting parallel to, as well as in close apposition with, the wall of the hoof (*b, c*), has its toe (*d*), instead of being advanced to *c*, descending and resting upon the middle of the sole, which, from the pressure of it, has bulged (at *d*), or, as farriers say, become *pumice*. For the further explanation of this, turn to page 424.

The dislocation or tilting of the coffin-bone upon the sole, necessarily causes a space within the foot between it and the wall of the hoof (*e, f*). This, we find, becomes filled up with a sort of *callus*, which in the course of time undergoes a gradual transformation into horny substance: as is intended to be shown by the yellow tint the drawing exhibits in the middle portions of the callus.

*g*, Section of the pastern bone.

*h*, Section of the coronet bone.

*k*, Section of the posterior parts of the foot.

*i i i*, Sections of the tendons.



Laminitis.



some aspect which may suggest a fanciful comparison of it to a crab or a toad, or any other unsightly or anomalous thing. It looks as though it hardly belonged to the limb; as though, in fact, it never could have been included within the confines of the hoof. With its fungous excrescences sprouting from it, wherever it happens to be bare of hoof, it conveys to our mind a notion that it is in a state of luxuriance or *hypertrophy*. This is supposing we do not see the foot until canker be fully developed in it. Had we happened to have inspected it at the beginning, or could we obtain the history of the case, we should almost invariably find that the germs of the disease were first discoverable within the cleft of the frog. This cavity becomes the *fomes* of corruption and decay. At its bottom and around its sides are visible shreds of dark-coloured, deadened, loosened portions of horn, which have become detached from the living surfaces beneath, through an acrid serous exudation from the latter, seen everywhere oozing out amid the crevices of the rotten and semi-detached hoof. The partial solution of this dead horn it is that has in places rendered the fluid black, and, from its becoming at the same time putrescent, intolerably offensive to the smell.

When we come to remove the discoloured and decayed horn, and to expose the sensitive surfaces, we find the latter covered with an opaque whitish caseous matter, supplying the place of what naturally should be fresh-secreted horn; but which is evidently in important respects different from it, no less in its aspect than from its property of continuing softness, and consequent unfitness for the purposes of cover and protection to the living surfaces. No sooner, however, is the resistance or pressure afforded to the secreting parts by the old horn (so long as it remains) removed than *fungus* sprouts up from the denuded and exposed surfaces.

FUNGUS, which may be said to constitute the *essence* of canker, is a white, soft, yet consistent substance, of fibrous composition, growing in such exuberance from the diseased parts that it not only occupies the place of the horny covering, but swells to a bulk much beyond the ordinary growth of the hoof, having its surfaces covered with layers of the white caseous matter but now mentioned, while its fibres and

crevices are bedewed with the offensive ichorous secretion which, from the solution of the old horn remaining, turns black around its roots. From the granular aspect the fungus ordinarily assumes, some have regarded it as a sort of exuberance of granulation issuing out of the *keratogeneous* or secretory tissue; while others, from its extreme vascularity and liability to bleed when maimed or cut, have viewed it of some such nature as *fungus hæmatodes*. Neither of these hypotheses will, however, bear examination. In an interesting paper written by M. H. Bouley on the subject of *crapaud* (canker) in the *Recueil de Méd. Vét.* for January, 1852, he has given it as his opinion, that the fibres of the fungus are nothing more than *prolongations of the villosities of the sensitive tissue of the foot in a state of hypertrophy*, bundles of which matted together in close union constitute the *masses of fungus*. And in confirmation of this opinion, he adduces the fact of fungus proving to be longest and most fibrous and luxuriant in situations where the villosities of the foot (which are the organs of touch) are known to be the most developed, such being the circumferent border of the coffin bone and the inflexions of the bars at the heels; whereas, in places, such as the body of the frog and the sole, where the same development of villosity is not met with, the fungus is comparatively short in texture, and indistinctly fibrous. And M. Bouley adds, that, as in the normal state the villosities never exceed a certain longitude in consequence of the wholesome restraint they meet with in their growth from the hoof covering them, so is this hypertrophic development or morbid growth of them to be attributed to the loss of such wholesome or normal restraint. The same thing happens, under other circumstances, in cases in which we are desirous to promote the formation of healthy horn. Without such *pressure* as at the same time maintains the growth within proper bounds, we well know how difficult this often is to accomplish. And what further favours this view of the matter is, that fungus is never seen in situations where *villi* or villosities are indemonstrable, as upon the surfaces of the laminae, &c.

It might be expected, that, since the fibres of the fungous growth consist, in point of fact, of hypertrophic *villi*, the fungus



itself would prove a highly sensitive substance ; whereas, so far from this being the case—though it be so vascular that it bleeds freely from slight injury—every practitioner well knows that it possesses no, or but extremely little, sensibility. Indeed, the animal himself shows this by the manner in which he steps upon it, and the extent to which he can endure dressings, and wounds, and pressure upon it. This loss or want of sensibility M. Bouley accounts for, by the thick coating of fibro-plastic matter in which the villi are included, in the course of their increased development, and which really, as it were, isolates the nerves from all surrounding impressions.

CANKER IS TARDY IN ITS PROGRESS, in general. Though so strong is the reproductive process that we can hardly repress the growth of fungus, this does not evince actual spread of the disease from part to part, but only the excited condition of such parts as are already in a state of disease. Still, this is only the case at certain times and under certain circumstances ; since every now and then it happens that the disease assumes a chronic, indolent inactive form altogether, neither spreading nor healing. So that, as might be anticipated from what has been said,

LAMENESS IS BY NO MEANS REMARKABLE IN CANKER. So far from it, indeed, looking at the condition of the foot, we are apt to feel surprised to find how firmly the horse steps upon it, and, after the diseased parts have been compactly bound up—providing no very sharp dressings have been used—how well he is able to perform work with it. When, however, the fungous growths have been cut or burnt off, and caustic dressings come to be applied to the morbid tissues, intense pain, and in most cases inflammatory action as well, follows the dressing, and for some time continues ; indeed, in some instances, so great is the suffering for a time consequent on caustic dressing that the animal is entirely taken off his feed by it.

THE CAUSES OF CANKER may be conveniently considered under the headings of *predisposing* and *exciting*.

*Predisposition to the disease* is said to lurk in “the heavy breed of cart horse ;” and certainly, the disease has appeared

oftener in such horses than in others ; but whether this originates in any " constitutional predisposition," or whether it be simply referrible to the fact, that such horses, from their habits, are more likely than others to contract canker, appears questionable. From the army, wherein canker once was so great a pest, it has, by attention to shoeing and stable management, been entirely banished ; and there seems no good reason why the same end by the same means should not be put to the disease in cart and dray and wagon horse establishments. Farmers, whose horses in general are worse shod and looked after than those of other people, in some parts of the country were at one time known to be, in too many instances, sad sufferers from losses by canker ; now-a-days, however, since reform has found its way into the farmyard, and improvement into the country shoeing-forge, but little complaint is heard about the disease. In fact, in the epidemic and malignant forms in which canker formerly prevailed, the eruption and character of the disease was clearly owing to neglect and mismanagement.

EXCITING CAUSES.—Supposing canker, since its primary seat is ordinarily the cleft of the frog, to be but a sequel of frush, the same causes which produce one may be said, by intensity or continuance, to give rise to the other. This is the usual notion of the production of canker ; but it is one which, for my own part, I cannot altogether reconcile with the results of experience. We know that horses will have frushes, and very bad frushes, for years together, to which no medical attention is paid, and yet canker never supervenes. On the other hand, we learn from observation that horses in certain situations can hardly have frush without canker speedily ensuing, unless prompt and efficient means be taken to prevent it. In hot, foul, ill-ventilated stables this is found to be the case. Let horses stand with their feet in the filth and muck of uncleansed stables until they contract frushes, and let their frushes go on unattended to, and canker will be the pretty certain result. This is one reason why the hind feet are more subject to canker than the fore. Or, let horses remain during the winter at straw-yard or in wet pasture, and, while their hoofs are becoming frushy, abandon them altogether to "take

their chance," and canker will be sure to be the consequence. All this would seem to show, that the secretory apparatus of the foot may, from continuance of such influences as heated and foul and impure stabling, or simply from exposure to wet and dirt, lose their power of producing sound horn, or indeed horny matter at all, and in lieu thereof pour forth the matter peculiar to canker, we call *fungus*.

Notwithstanding canker may ordinarily originate under the guise of frush, yet may it issue out of other local causes. Grease, from the matter trickling down over the heel into the cleft of the frog, may give rise to disordered action of that part, which, sooner or later, may end in the generation of canker. Quittor, likewise, it is said, may produce it; though this is an effect I have had no evidence of myself. In a foot disposed to take on cankerous action, there can be no doubt but that any lesion of frog or sole may be followed by the disease. By far, however, the most common origin of the disease is under the mask of frush.

**PATHOLOGY OF CANKER.**—Close observation during life has shown, while post-mortem examination has confirmed the fact, that the horn-producing—the *keratogeneous*—tissue is the part specifically diseased in canker, and to this delicate tissue, and its soft *substrata*, the cellular coverings of the frog and sole, the disease is confined: neither bone, nor tendon, nor cartilage being found implicated in its spread. On this part of my subject I rejoice to have an opportunity of deriving information from a very interesting report obligingly made of a cankered foot, which had been submitted to him by M. Bouley, by M. Robin, Professor of the Faculty of Medicine at Paris, who, with the aid of the microscope, found "that the anatomical lesions in the tissue forming the horn bore, to appearance, no relation to the great and remarkable changes apparent in the horn itself. And yet, this disparity, great as it is, ceases to excite surprise when we come to reflect that the extraordinary change is not in a constituent tissue of the body, but only in a product of secretion. In a word, the lesions of the *matrix* and of the papillæ, *although anatomically inconsiderable*, are indicative of a chronic inflammation; while, on the other hand, the softness and thickness of the corneous

matter, not yet become true horn, seems to indicate a secretion so rapid that, in its progress, time has not been allowed for its due conversion into compact horny tissue."

To this authority M. Bouley adds—"Thus is microscopic research perfectly in accord with ordinary observation, since both show, that, in canker, not only is there no scirrhus nor cancerous change of the morbid tissues; but, further, that the lesions of these tissues are, anatomically, very inconsiderable, consisting, after all, in no more than chronic inflammation. And besides, resulting from this double demonstration, comes the telling fact, that the horny secretion, so far from being interrupted, is, on the contrary, more abundant under the influence of canker, though the secreted product does not possess all the actual properties requisite 'for its due conversion into compact horny substance.'"\*

Mr. Gavin, V.S., Edinburgh, has twice met with canker in a form which, though assuming its ordinary aspect in the foot, seemed dependent for its existence upon a state of limb consisting in some anormal condition of the absorbents, and apparently of the veins as well. The leg exhibits enormous tumefaction from the hock downwards, and issues forth through the skin "a sanious greasy discharge." There is also present ulceration in the bend of the heel, any suppression of the issue from which aggravates the cankerous disease. Indeed, so dependent is the latter on the limb affection that Mr. G. considers one incurable so long as the other continues.—May not this case be a *sequel* of inveterate canker?

### *Treatment of Canker.*

TREATMENT OF CANKER.—In accordance with the foregoing views, canker would appear rather to consist in disease of the keratogeneous structure than in any change of the deeper-seated tissues. The secretion of horn is superseded by the production of *fungus*, and this fungus-generating action is so predominant in the secretor apparatus that, when once established, the

\* 'Recueil de Médecine Vétérinaire,' de Janvier, 1851.

morbid secretion continues for a length of time in spite of every effort on our part to suppress or correct it. While the manifestation of hypertrophic action in this exuberance of production is too plain to be denied, there is at the same time evidently at work some abnormal action which nothing short of the actual destruction of the orgasm—and not always even that—is found to eradicate, so as to re-establish the secretion of sound horn. M. Bouley's "chronic inflammation" will not by itself account for the phenomena of canker, no more than it will for the obstinacy the morbid function sets up against treatment. This explains why, as experience shows, no radical or permanent cure of canker can be brought about without the use of caustics or escharotics, coupled with the aid of the knife or the actual cautery, as occasion may require. And with all this, *time* will be necessary to bring about sound and healthy secretion. So great and paramount is the morbid disposition to generate fungus, that the morbid productions will frequently require being destroyed, again and again, down to their very roots, before sound horn can be induced to spring up in their places.

Were we not taught this harsh practice by experience, or could we find any more lenient mode of procedure, mild treatment would turn out not less acceptable to ourselves than comparatively painless and pleasant to our patient. But we apprehend no plan of treatment of the kind *with any prospect of success* offers itself to our notice. M. Bouley, after finding fault, commendably enough with our destruction of tissues, when, as he says, the error is not physical but *functional* only, recommends the following—certainly comparatively humane—method of procedure:—

FRENCH MODE OF TREATMENT.—The cankered foot to be cut down to the extent required, and then to have such a shoe properly fitted as will admit of the requisite dressing and pressure. All loose portions of horn to be removed, without, if possible, making the parts bleed or wounding such as are sound; though nothing is to stand in the way of the complete denudation of the diseased parts. This done, any very exuberant fungus, likely to resist dressing, is to be excised; after which, the entire diseased surface is to be covered with a thick layer



of tar upon pledgets of tow, supported by splints and bandages calculated to give the requisite pressure. And this dressing is to be daily renewed. Perseverance in such measures is enjoined for several days, taking care at every dressing to remove all horny matter anywise unsound, and to cover the places over afresh with tar; under which mode of procedure we shall, says M. Bouley, every day perceive healthy action spreading, to the gradual diminution and decay of the disease. Nor do we doubt his assertion, when we read, further on, that, in the most common cases, he is in the habit of using, in combination with the tar, such agents as *the undiluted sulphuric, nitric, and hydrochloric acids, concentrated solution of caustic potash, quick lime, the caustic ointment of Solleysel, the caustic paste of M. Plasse, &c. &c.* M. Bouley adds, that, with the indispensables of time and attention, such treatment will prove successful; from two or three months being required for the cure.

Discovering in the foregoing account of treatment nothing that need divert us from our accustomed plan of operation, we proceed to a detail of measures which have, not in our hands more than in hundreds of others, turned out the best adapted for the cure of canker, in as short a time and with as much certainty as the nature of the particular case will admit.

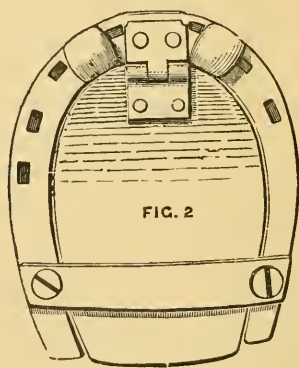
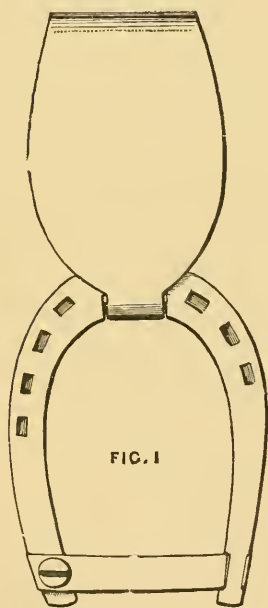
BEFORE THE TREATMENT OF A CASE OF CANKER BE UNDERTAKEN, it becomes the duty of the veterinary surgeon, in order that he may guard himself against any ulterior blame or dissatisfaction on the part of his patient's master, to represent to the latter the probability of cure, as well as the time likely to be required for it. The extent and malignity of the disease, the duration of it, the age and value of the horse, should all be taken into the account, lest it be found, in the end, that the doctor's bill, and the keep of the patient whilst under treatment, overbalance the animal's value. Nor must it be forgotten, that, although treatment may prove successful in eradicating the disease, yet should it do this and leave such deformity or disorganization of foot as proves the cause of unsoundness, still will the proprietor of the horse have reason to complain of the doctor's work. Canker in any form is an intractable disease. In some forms, indeed, it has been pro-

nounced incurable; though I cannot say, in my own sphere of practice, I remember to have found it so. But we read in White's Farriery of its been "difficult of cure," and not "unfrequently incurable;" and French writers of the same date speak of it as "*l'opprobre de notre art.*"

THE FIRST THING TO BE DONE, supposing this to be the earliest treatment of the case, is to take off any shoe the cankered foot may have on at the time, and, after paring down all exuberant growth of horn, by well lowering the heels and shortening the toe of the crust—anormal growths which such a disease as canker is certain to produce—to subject the foot to such close and thorough scrutiny, as shall, through the instrumentality of the drawing-knife, end in the removal of every portion of dead, loose, or semi-detached horn, as well as any living horn which may be in immediate contact with the cankerous parts, in such manner as not only to completely lay open the diseased surfaces, sinuses, and crevices, but at the same time, as much as is possible, to isolate them. All contact and communication between sound and unsound parts must be cut off; and then, but not until this be completely effected, are we to think about dressings. The less hæmorrhage we produce, in accomplishing these indispensably necessary cuttings and parings, the better; bleeding not only being uncalled for, but tending to interfere with such operations, besides being unfavorable to the application of dressing; we must not, however, suffer hæmorrhage to thwart us in our object, one so important towards cure that, if not carried completely out the first time of paring and dressing, certainly ought, on the second occasion of dressing, to be put effectually into execution.

THE NEXT THING TO BE DONE, after the diseased foot has been thoroughly searched and exposed by the drawing-knife, is to fit a shoe, as a covering and defence to it, of a description which, while it admits of being nailed to the foot, affords every facility of applying and removing dressings, and at the same time—supposing the foot to be in a state to admit of it—enables the horse to perform more or less work. For canker-footed horses, especially of the heavy or agricultural class, are much better kept at work than remaining at rest: they maintain better health, and from this cause, as well as from the

motion and pressure given to the foot by exercise, it is found that their cure proceeds with more rapidity and certainty : added to which, the shoe enables the practitioner to confine his dressings to the foot, and make the requisite compression with very little comparative trouble. Sometimes a plain shoe, sometimes a three-quartered shoe, sometimes a bar-shoe, is the one best suited for the case. But a shoe which possesses peculiar advantages in canker is what is called the *box-shoe* ; since it not only serves for protection, but it is a great defence against injury and dirt and wet, during the time the horse is at work. And of box-shoes, I know of no better description than those recommended by Mr. Wells, V.S., of Norwich, woodcuts of which are subjoined.\*



\* See 'The Veterinarian' for April, 1851, p. 196.

Now, however, that leather and gutta percha are introduced into the forge, we may, either with a plain bar-shoe or a common shoe, make use of either of them as a cover and protection to the dressing; though, of course, the durability of such substances has its limit, and they may in consequence turn out, in the end, somewhat expensive. The proper leather for use is the *sole leather* of shoemakers, which will have to be secured with the nails of the shoe. The gutta percha has the advantage of being capable of being moulded into the sole of the foot, while the shoe is on, by being previously made soft and flexible through immersion in water at nearly the boiling heat, and becoming, when cold, hard and firm again, and so proving a substantial protective. In this way the same piece of gutta percha may be used for several times; each time, however, it will be found to have become less affected by heat and cold, and to have shrunk, so that ultimately it turns rotten, and calls for repair or renewal. The box-shoe, in durability, has, of course, the advantage over these contrivances; but it is heavier for the horse to carry.

THE PRINCIPLE OF TREATMENT, so far as the separation of the anormal from the normal parts, being fully and satisfactorily carried out, must now be completed by the destruction of the former, and the preservation of the latter from the same diseased action. The drawing-knife laid aside, the shoe best adapted for the foot should now be determined, and be fitted and nailed on. This done, the dressing may be commenced. Fungus presenting itself in prominent masses may be pared down to a certain extent with the scalpel: though this is a practice I am myself not friendly to, unless the fungous growths be of extraordinary luxuriance, and then great care is required, since the operation is very likely to excite troublesome and by no means salutary hæmorrhage. Some practitioners burn down the fungus with a red-hot iron, or cut it off with a sharp firing-iron: this is a practice, however, which for my own part I do not pursue. In cases of the ordinary description, I think the object may be accomplished, and, in fact, is best effected by

DRESSINGS.—Whereof, for the most effectual and curative I may, in truth, say, the pharmacopeia has been literally ran-

sacked. Caustics have obtained, and I think, deservedly so—most favour; though astringents, stimulants, antiputrescents, &c., have likewise been introduced, and no doubt on occasions, in certain forms and stages of the disease, have their utility. For the accomplishment of the primary object, viz., the destruction of the fungus, I am acquainted with no caustic so powerful and effectual as the undiluted nitric acid. Sometimes I use the sesquichloride of antimony (the butter of antimony); and, as a variation of the caustic dressing, and one not so virulent as the nitric acid, it is very useful in its turn. I have likewise employed for the purpose the various preparations of arsenic, mercury, copper, zinc, &c.; but though some of these will be found very serviceable as we proceed, there is no dressing so great a favorite with me for the “eating away” of the fungus as nitric acid. Its effect is instantaneous and decided, and its erodent operation is confined to the parts it touches. Supposing we make up our mind to previously pare down the sprouting fungus with a sharp knife, the dressing ought immediately to succeed this. In ordinary cases, however, this is not required. Simply wiping the diseased parts dry will be sufficient; which done, with a sort of mop—made by twisting a skein of tow around the end of a small stick—the fungus ought to have every part of its surface thoroughly imbued with the acid, by well mopping and rubbing the dressing into its pores and clefts and crevices. Or, should the butter of antimony be preferred, let it be used after the same manner. This done, thick pledgets of fine tow must be laid upon the cauterized surfaces, and upon them similar pledgets of coarse tow—that answering every purpose for an outer covering, and the whole pressed down with as much force as the diseased parts can bear, and the *tout ensemble* confined within the hollow of the foot by cross-bars of iron hooping, of the requisite length, driven with a hammer underneath the web of the shoe, and nicely adjusted to their situation by a final blow or two from the hammer at such places as they may show any appearance of bulging or bowing downward. This is the common mode of securing the dressing when no leather or gutta percha or box shoe is made use of; cases in which, of course, cross-bars will not be required. Should the disease have



made such incursions into the foot as to render it impossible, after the necessary paring has been made, to find sufficient hold of crust for nailing a shoe to, the dressing must be bolstered up with an abundance of coarse tow, over which a piece of sacking or coarse cloth may be wrapped, the whole being bound together with tape, or, what proves an exceedingly useful ligature in such cases, rope-yarn or tar-cord, with which the foot, thus thickly clothed, ought to be cleverly and *tightly* packed up.

A “sharp” dressing of this description will be likely—especially when *extensively* used—to excite a good deal of pain in the foot, and this may be followed by some amount of constitutional irritation; indeed, so irresistible is the appeal made from such effects sometimes, that, for humanity’s sake, if not from a sense of danger, it becomes necessary to remove the dressings, and immerse the cankered foot in a warm bath, succeeded by a poultice, and to give the animal some medicine, should he not have already had any: I say “already,” because it ought to have been mentioned, that, in all such cases, it is an excellent practice to administer in the first instance a full dose of cathartic medicine, which, coming into operation about the time that the sloughing is at its height, is likely to be attended with the best results.

Should nothing call for the removal of the dressing, however, it had better remain undisturbed for two, if not for three days, depending upon the circumstance of the horse having been in the stable the while, or at work; for the process of sloughing is found to go on quicker under work or motion than while at rest: showing that work of the kind that has been recommended, provided the ground be not wet or muddy, so far from being objectionable, will be found beneficial, whenever the patient is able to take it. When the dressing comes to be removed, the aspect of the cankered parts will be found completely changed. There will remain comparatively little or no fœtor; while the fungus, which before was porous and full of ichorous oozings, and possessed a degree of transparency from the discharges standing in globules upon its surface, has now turned an opaque white, and crumbles away or peels off under friction like so much milk-curd; and the sinuses along the sides of

the frog and bars, from which issued more discharge than from anywhere else, appear dried up. This, which may be regarded as an amended condition of parts, in contradistinction to that state of the diseased foot in which the dressings come off soaked with the discharges, must not, however, be suffered to delude us into a hope that no repetition of caustic will be necessary. Caustics or escharotics in some form will be required so long as any fungus, or disposition to engender fungus, remains, and until the cleft and crevices be not only dried up, but present at their bottom red granulating surfaces, with clear white borders of sound though soft horn.

A SECOND AND A THIRD CAUSTIC DRESSING may be called for; though, having reference of course to the nature and intensity of the particular case, some modification may be required in the application of the dressing, as well as in the dressing itself. There may be only certain parts which now need the strongest corrective; or, we may choose to employ the butter of antimony in lieu of the nitric acid. Some places indeed, do not generate fungus, but simply issuing ichorous secretion, will be best corrected by a milder caustic, such as sulphate or acetate of copper. For it may be here observed in cankerous affections we make use of two distinct kinds of caustics; the one *erodent*, eating off the substance to which it is applied, such as the nitric acid, butter of antimony, &c.: the other, simply *escharotic*, productive of slough; such as are the sulphate and acetate of copper, bichloride of mercury, arsenic, sulphate of zinc, &c. Fungous excrescences will at all times require erodent caustics; while morbid secreting surfaces, and parts indisposed to throw up granulation, may be left to escharotics. The grand difference to be observed between the treatment of ulceration of the foot and common sores in other parts of the body, consists in the *pressure* found to be so salutary and requisite for the former. The foot being a part which, from its natural habits, may be called *the organ of pressure*, the same influence appears indispensably necessary to it under disease, as a stimulus to excite its vital powers to resume their normal functions.

When once we have got quit of the fungus, and have annihilated all power to reproduce it, we may bring about the

healthy secretion of horn by such escharotic and stimulant dressings as, from trial, appear best suited to the case : always bearing in mind that *change of dressing* usually turns out beneficial practice. Parts will often for a time progress favorably with a dressing under which they will retrograde if the same be persisted in beyond a certain period. There is no better escharotic for general purposes than the sulphate of copper. The acetate of copper, which is likewise an excellent one, is used with most effect in the form of the ointment known by the name of CANKER OINTMENT, a formula for which will be found under the head of Frush.\* A capital form of the "blue solution" is the compound solution, containing sulphuric acid, as recommended by Mr. Morton ; which is also particularised under Frush. In fact canker, when once deprived of its fungus-generating property, is reduced to much the same disease as frush is that has underrun the frog and the sole, a state in which it is calling for similar treatment. During this stage, when stimulants are indicated, common tar or the oil of tar or oil of turpentine may be occasionally used. At any time when fœtor requires correcting, the chloride of lime, either in powder or solution, may be introduced. In fine, I might, were I to look down my own list, without adverting to the favorite remedies of others, enumerate dressings almost *ad infinitum*. Let it suffice to say that, be dressings as numerous as they may, the hand of science must select them as well as direct their use ; the objects of treatment in the disease under our consideration being, to destroy anormal productions, correct morbid and faulty secretion, and substitute in its place the formation of normal horn.

## CONTRACTION.

CONTRACTION or *hoof-bound* denotes an anormal approximation of the heels of the hoof, and mostly of the quarters as well.

A NARROW FOOT is not necessarily a *contracted foot*. Of hoofs in general the outline approaches nearer to the circular than to any other figure. Some horses, however, possess by

\* See p. 439.

nature oblong or ovoid feet, such as Arabs and Barbs, and Sicilian horses, and many of our thorough-breds. Mules and asses are never seen with any other description of feet. With this narrow form is frequently combined a white hoof, uniformly one of luxuriant, strong, and tough fibre, high heels, and concave sole.

CONTRACTION MAY BE GENERAL OR PARTIAL. It is said to be *general*, when the quarters as well as the heels of the hoof are involved: and in this case it very commonly happens that the wall is *straight* or anormally upright. Contraction is *partial* when confined to one or both heels. On rare occasions it is observable in one heel only; though commonly both are affected, and often the inner more than the outer heel. Sometimes one foot is contracted; sometimes both feet. The hind feet are not subject to contraction; the reason for which will be pointed out by-and-by.\*

CONTRACTION IS PURE OR MIXED. Pure contraction exists without any collateral disease of foot; or, at least, without any in connexion with it. *Mixed contraction* is contraction accompanied by inflammation, or by one or other of its consequences.

THE SYMPTOMS OF CONTRACTION may appear too obvious to need description. In some instances it certainly is manifest enough; but not in all. When one foot is contracted while its fellow retains its normal character, a comparison with the eye between them, as the horse stands confronting us, will readily detect the anormality: the discovery being, as is very likely, aided by the circumstance of the horse going lame in the contracted foot. But when both feet are contracted, and both consequently alike in aspect, and the same in action, it may assist our judgment to revert in our mind to what sort of foot such a description of horse ought by nature to possess; though, even in this case, without any reference to what the feet ought by nature to be, we may, by close and critical ex-

\* There is a kind of contraction, called *vertical contraction*, which consists in diminution of the diameter across the interior of the hoof, between the sole (which is become anormally *concave*) and the wall. It is denominated *vertical*, to distinguish it from that now under our consideration, which has had the name of *lateral* given to it.

amination, detect the anormal changes in them. Combined with a narrowing from side to side, there will be visible straightness of the quarters of the hoof, with a turning-in, more or less sudden and angular, of its heels, which glide or shelve forward, inward and downward, so as to vanish from our sight—as the horse stands before us—before they reach down to the heels of the shoe; which are made so much too wide that the heels of the hoof rest upon the inner edges of the shoe; so that when the foot is held up, and we behold nothing but its ground-surface, the false width of the heels of the shoe delude us into a notion that the foot is a broad enough one, when in reality it is in a high degree contracted. This is a deception to which the smith—probably at the instigation of the dealer—contributes by, in his own language, “opening the heels” of the hoof: an operation consisting in cutting away the bars, thereby throwing the channels of the commissures into the general concavity of the sole, and so making the latter appear ample and extended; while the heels, from having their points at the same time obtruncated by the drawing-knife, have the false look of being considerably widened.

A young examiner of horses should be particular in guarding against delusion like this; and he will find it best exposed if he take up his position behind the horse, so as to direct his view upon the posterior parts of the fore feet from between the hind legs. This will enable him to judge of the high or low condition of the quarters of the fore hoofs, as well as to descry the unoccupied spaces left upon the heels of the shoe, from the unnatural curving-in of the heels of the foot: such insidious curving-in of the latter, one or both, being always a strong indication of contraction.

PREDISPOSITION TO CONTRACTION lurks in breed or kind of horse, with which it is often hereditary. A good deal also depends upon the country—the nature of the soil, and the dryness or humidity of the situation—wherein the animal happens to have been bred or brought up, since that will, in a measure, so influence the quality of the horn as to render it liable to contraction. Horses of the breeds and from the countries I have named, having light bodies to carry, with hoofs of the oblong description, and strong luxuriant fibre, and



which possess light and near-the-ground action, may be said to be predisposed to contracted feet. On the other hand, heavy horses—such as are used by agriculturists and brewers, &c., are subject to disease or deformity the opposite of contraction. Thin hoofs, of weak fibre, broad and flat, and such as are sprawl, are prone to disease of laminae, and to become *pumice*. Colour has been said to harbour some predisposition to contraction. Blaine insists upon the dark chestnut being its favorite subject. The texture and colour of the hair may have an influence over its correlative tissue, the hoof; and certain colours may prevail among light or well-bred horses, or among horses of certain countries. Farther than this I can perceive no connection between colour of coat and contraction of hoof.

THE CAUSES OF CONTRACTION, i. e., of *pure contraction*, are either *direct* or *indirect*. I shall consider the latter, as being the more influential, first. In order to render the nature and operation of this set of causes intelligible, it will be necessary to premise an observation or two on the physiology of the foot. Made, as this organ is, for the double purpose of supporting the weight of the horse's body and moving under it with elasticity or spring enough to ward off concussion, its structure is such as to enable its component parts to possess certain motions, one upon the other, so that the effect of the whole together may be, expansion of the hoof during the imposition of weight and the force of action upon it: retraction of the parts taking place the moment such weight or force of action ceases to be in operation. This property of yielding or expansion it is which, while it answers the purpose of a spring to the animal body, acts counter to that tendency inherent in the hoof, particularly when deficient in its natural or supplied moisture, to shrink or contract within itself. What is called the *spread* of the hoof, apparent as the wall grows downward, is owing to its expansive property; and this spread, as we know, is, in the natural or unshod hoof, more conspicuous in the outer quarter than in the inner.\* So long as there exists nothing to prevent this

\* Connected with this part of my subject comes a material fact—one

function of expansion from going on uninterruptedly, and it continues to receive the necessary *primum mobile*, so long will there be no contraction. This accounts for our hardly ever seeing a contracted hoof in a state of nature. But the period arrives for the horse to be shod, and now what happens? From the very moment a shoe is nailed to the hoof is its faculty of expansibility more or less impaired. It can no longer, under the same force or weight, yield or expand to the same degree it did before. The consequence is, a slow but gradual change in its form takes place. Instead of continuing the open-heeled and expanded foot it originally was, the first thing that happens is, that its spread becomes obliterated; after which it alters, gradually, almost imperceptibly, from the circular to an ovoid figure, until at length it becomes a *contracted foot*. We must not, however, infer from this that shoeing is the sole cause of contraction, any more than that every horse who wears a shoe must necessarily have a contracted foot. Were this the case, the hind feet, as well as the fore, would exhibit contraction; and this, we know, they never do. Shoeing fails to bring about this end in cases in which the expansive powers of the foot are powerful enough to overcome its counter-active influence; as is the case, from the impetus of their action, with the hind feet; as also, from the natural weakness of its fibre, and consequent feeble power to contract, is the case with the naturally spreading or flat foot. But, in the foot in which, from the strong and exuberant fibre of its hoof, from the height of the heels, the

elicited through the accurate observation of my friend, Mr. Gloag, of the 11th Hussars, to whose kind communication I am indebted for it—which is, that there is always found to be a sort of natural contraction going on in that quarter of the hoof in particular which receives the greatest portion of the weight, and consequently experiences the most wear: whilst at the same period of time divergence or spread of the wall is taking place in the opposite side of the hoof, in the direction of the tread. This accounts for the spread not being uniformly in the outer quarter, or rather, outer part of the hoof; for whenever horses are found to turn their toes inward, instead of outward, from the weight descending mostly upon the outer side, the hoof becomes straight in that part, while it is found to bulge or *spread* upon the inner side.

concavity of the sole, and the little or no pressure there is made upon the frog, there is evidently a disposition to contraction, shoeing will very influentially operate in bringing about such anormal alteration in its form. I have no objection to adopt, on this part of my subject, the first three words of the motto chosen by Bracy Clark,

Naturam ferro expellis ;

though I cannot add, *usque dum non recurret*, because I feel that Nature, up to an incalculable advanced period of time, preserves, and, if released from her fetters—the shoe—manifests, her *power of returning*.

ABSENCE OF PRESSURE TO THE FROG is another indirect cause of contraction, though one of inferior efficacy to the former. It was such a favorite, however, with Coleman, that he placed it in the foremost rank of causation : his argument being mainly based upon the notorious facts—that horses possessing sound and prominent frogs exhibit open heels ; while such hoofs as have their frogs shrunk or diseased or cut away, become contracted. Such reasoning, however, specious as it may appear, is untenable, inasmuch as it is grounded in error. Coleman took the case of *shod* horses, and, as far as they went, he found, with some exceptions, that, so long as the frog was preserved sound and prominent, contraction was in a degree opposed ; whereas, it frequently supervened upon faultiness or defalcation of frog. But, did he look for, and if he had would he have found, the same result happening in horses *without shoes* ? Rather, would he not have discovered that horse's feet, even though they were contracted, and had diseased frogs or hardly any frogs at all, supposing the shoes were taken off them, would, under the freedom from restraint their structures enjoyed in the absence of shoes, have by degrees recovered, not only their lost width, but their sound and prominent frogs as well, time only being given them for such changes to be brought about. The action of the frog is but a *secondary* power in the expansion of the hoof, and when the heels of the hoof are fixed, as they are by those of the

shoe, has but feeble agency, unaided by the great expansive effect of the wall of the hoof, of itself in dilating the heels.

WANT OF WEIGHT OF BODY AND OF FORCE OF ACTION in the subject may account for lack of expansive power, and so for the predominance of the contractile force. Light horses having slender bodies and going near the ground, with hoofs of a strong and upright and growing fibre, are very subject to contraction from the diminished power there exists in them to expand feet requiring greater force for their expansion; though, if they should happen to possess high stamping action, this power becomes much augmented during the time they are going. But, even in this case, were it not for the unceasing counter-active effects of the shoe—or, in other words, were the foot set at liberty by being unshod—it would be only under certain circumstances that the operations of nature would be overcome by any such deficiency. Indeed, when horses are shod with tips, so long as the heels are left at liberty, it rarely—*never*, I believe I may say—happens, that this cause, or even want of pressure to the frog, operates to the production of contraction. Standing tied up in the stable no doubt tends to favour the operation of such causes; but even here, were they not aided by the imprisonment of the hoof by the shoe, their influence would be comparatively feeble.

THE DIRECT CAUSES OF CONTRACTION are neither numerous nor effective when put into competition with those we have mentioned—the *indirect*: at the same time, when operant with the latter causes or such as tend to prevent expansion, they become to a certain degree influential. No agent can be said to be *direct* save one whose effect is to produce actual contraction. Such influences as operate in occasioning shrinking of the dead hoof or shrivelling of detached horn, such as drought, heat, and evaporation, may be expected to take more or less effect upon the living as well as the dead hoof, if not in their ordinary form, at least when applied in any inordinate degree. Heat has this tendency; and so has long-continued drought, or anything that robs the hoof of its moisture. The heat of the stable, standing upon fermenting litter, or the absence of moisture to the hoof in a situation and at a time when its own natural juiciness and humidity

is departing from it, may, any one or all of such like influences, dispose a hoof of a certain character to contraction. But such agents will be greatly more effectual on shod than on unshod hoofs.

THE VARIOUS AND APPARENTLY OPPOSITE CAUSES set down to the account of contraction by writers on the subject, for the most part will, if what I have advanced be based upon the results of experience, admit at once of explanation and even of reconciliation. The list of causes as given by Blaine is—"neglect of paring away the adventitious growth of horn; the application of artificial heat; the deprivation of natural moisture; constitutional liability; the existence of frushes; the removal of the bars, and too great lessening of the frog, the effects of pressure occasioned by long confinement in a state of inactivity, and in an erect position; and, lastly, the contracting effects of shoeing."\* Of which "list" Youatt approves in the following terms:—"A very excellent writer, particularly when treating of the foot of the horse, Mr. Blaine, has given us a long and correct list of the causes of *injurious* contraction, and most of them are, fortunately, under the control of the owner of the horse."†

Now, much as I respect the opinions of these two defunct eminent writers, I cannot help thinking that both of them have evinced deficiency of observation, let their experience have amounted to much or little, on the subject before us. I repeat it again and again, that, were it not for the (indirect it is true, but still) potential influence of the horseshoe, we should have to complain but very little of the production of contraction, since only under particular circumstances, and rarely even then, are any of the causes mentioned, of effect, in giving rise to it. Contraction is the last thing we apprehend in unshod horses. Nor even when horses are kept constantly shod with tips, *ab initio*, do we hear that contraction is among the evils which may then befall them. Such being verily the state of the case I cannot help expressing my surprise, to read in Youatt's work such passages as—

\* Blaine's 'Outlines of the Veterinary Art,' 5th and last edit., 1841.

† 'The Horse.' By W. Youatt. The new (or last) edition.



“The opinion is perfectly erroneous that contraction is the necessary consequence of shoeing.”—“Shoeing may be a necessary evil, but it is not the evil some speculative persons supposed it to be.” By way of “plain proof” whereof, he states—“that although there are many horses that are ruined or injured by bad shoeing, there are others, and they are a numerous class, who suffer not at all from good shoeing, and scarcely even from bad.” Coleman said the same thing;—by shoeing properly, *ab initio*, contraction might be prevented. And so far as *pure contraction* is the question, there is, no doubt, truth in this. But it is not the whole truth. The majority of cases of contraction are, as we shall by-and-by see, *cases of mixed contraction*, such as are produced under the influence of the shoe, and such, I may add, as without the shoe we should most certainly, comparatively speaking, hear but little complaint about.

PURE CONTRACTION DOES NOT PRODUCE LAMENESS. Coleman’s mode of reasoning, derived from the works on farriery before him, was, that hoof-bound or contraction of the hoof caused pain or lameness, by squeezing the sensitive tissues of the foot contained within it, after the manner that tight shoes or boots squeeze our own feet. It is observable, however, that lameness never sets in until inflammation has made its appearance. A horse recently lame in a contracted foot will manifest heat in that foot, showing that the lameness is not the result of the contraction—which may have been present long before—but of the inflammation which has supervened upon the contraction. Indeed, when we come to reflect upon the history of the case, to consider how long a time the contraction has been, by imperceptible degrees, coming on, and that the parts within the hoof cannot fail, during this length of time, to have accommodated themselves to the contracted space, as well by absorption as by alteration of position, we can hardly suppose that lameness would be consecutive on the contraction. Even the inflammation is not directly referrible to the contraction. Rather, it is much more likely to be excited by some concussion or contusion sustained by the narrowed foot in action, to the production of which no doubt the contracted, unyielding, *rigid* condition of

the hoof has mainly contributed. But the time is come for us to consider

MIXED CONTRACTION—that kind of contraction which *does* occasion lameness—is contraction in combination with inflammation, or some one or other of its consequences. Now that we know so much about navicularthrititis, we can readily understand how it was that Coleman was so continually deluding himself and others by ascribing lameness to contraction. At the time he did so he was ignorant, if not of the very existence at all events of the great prevalence, of disease of the navicular joint. He beheld the contraction, and beyond that there was nothing in his eye to account for the lameness. He took the inflammation present to be the consequence of the contraction: not dreaming that it depended upon a deep-seated lesion. Moorcroft advanced a step further towards the development of the real or proximate cause of the lameness. He suggested the presence of *pure contraction*, as distinguished from *contraction connected with deep-seated injury of the foot*. To Turner, however, it was left to discover in what this “deep-seated injury” consisted. Through the unerring guidance of pathological anatomy he demonstrated that it was not the coffin-joint which was the seat of injury, but the *navicular joint*. “I have dissected all the groggy feet I have been able to procure,” says he, “and have found *the navicular joint diseased in every instance*.” But, is a “groggy” foot a *contracted* foot? Not necessarily. Sometimes it is, sometimes it is not.

Where then, let us inquire, is the connexion between navicularthrititis and contraction? This part of our subject has already undergone discussion:\* I need therefore only repeat here, that although a horse exhibiting navicularthrititis may not have a contracted foot at the time, but on the contrary, as we so often have occasion to remark, a good open foot, still, from the repose while in the stable, and the favouring at the time of going, such foot will be sure to experience, will it in time become a contracted foot. And this it is that, in the majority

\* Turn back to p. 141 of this volume.

of cases, constitutes the chronic, hoof-bound, too often incurable, lame horse. Indeed, it matters little what the form of the foot is at the time of the attack of navicularthrititis. Long duration or repetition of lameness will be sure to induce contraction sooner or later; and, in the end, contraction will form a feature in the case strong enough to mislead those who may not be acquainted with its history, or know enough of hippopathology to reason properly on it. The seat of lesion giving rise to the inflammation present in contraction accompanied by lameness, will very well account for the horse continually going upon his toe, without supposing it to arise, as Coleman curiously enough did, from disease of the *laminae*. But, will it account for the heat we so invariably feel, not in front alone, but all round the wall of the hoof, and for the heat, and tumidity as well, of the coronet? I think it will, very satisfactorily, when we come to consider that, contraction not being a primary or immediate, but a secondary and remote consequence of navicularthrititis, at the period it makes its appearance inflammation must either have existed for some time or be in some relapsed, perhaps aggravated form; and that therefore it has not confined itself to the posterior but has extended to the anterior parts of the foot: in fact, has spread generally over the whole internal foot. And when we come further to remember that the inflammation is said to run sometimes high enough in navicularthrititis to cause the pastern arteries to "throb," we need feel no surprise that the pastern, or coronet rather, should evince heat and take to tumefy.

PREVENTION OF CONTRACTION. If the principles I have laid down be in accordance with the results of accurate observation, shoeing must be regarded as the main cause, indirect though it be, of contraction; and to the modification or correction of it must we look for the prophylactic. Shoeing, as it respects horses, has been said to be "a necessary evil." Without shoes, upon our artificial roads we cannot make use of horses; and no shoes have been found to answer save such as are hard and inflexible or metallic, and as are fixed to the hoofs with nails. Here, therefore, we find ourselves in an awkward dilemma. We cannot do without horseshoes; yet from the moment we

nail them to the hoofs do the feet begin to undergo more or less alteration in form, and in too many instances to experience harm from their application. The art of shoeing has given rise to a wonderful deal of difference of opinion and controversy, some thinking one shape of shoe answering best, some another; while some prefer one mode of nailing it upon the hoof, others a different one. As far as my own experience has served as a guide to me through this labyrinth of opinion, I have ever found that method of shoeing the preferable one which approached the nearest to nature, or, in other words, which interfered the least with the economy of the foot. If we could do without them, horseshoes would, undoubtedly, be best abolished altogether; but, since this is impracticable, let us adopt such shoes and modes of attaching them to the hoofs as are found to work the least mischief to the feet. On this principle it is that a half-shoe is to be preferred to a whole shoe, and for the same reason it is that *tips*, of all the horseshoes that were ever invented, are the best, inasmuch as they are the least objectionable. If those in the profession would come forward and inform us of their experience—those who have had any—of tip-shoeing, I believe it would uniformly be found, that whatever objections might be urged against the use of tips, no one would deny their tendency to interfere the least with the operations of the foot. If there be any horseshoe calculated to prevent contraction, and navicularthrititis as well, I feel no hesitation myself in pronouncing that horseshoe to be the tip.

In saying so much, I am fully aware that tip-shoeing cannot be introduced into general practice for reason of the roads horses have to travel and work upon, and of the numbers of horses having hoofs of too weak and brittle a fibre to stand work without their chipping and breaking and wearing too rapidly away; yet on horses whose hoofs are strong and hard enough, and whose work is light enough, to admit of their wearing tips for any length of time, or in situations where the roads or parts of the country they have to do work upon enable them to wear tips constantly, no full-length shod horses' feet will ever bear a comparison with theirs.

**PRESSURE TO THE FROG.**—Coleman's favourite prophylactic against contraction—considering shoeing to be an indispensable evil, must certainly be regarded as next in importance, as a preventive, to getting quit of the shoe itself, or of part of it. The frog being a body which in action operates in the expansion of the hoof, the removal of it, or even the impairment of it, must necessarily give facility to contraction. It therefore behoves us, in ordinary shoeing, to look well to the preservation of the integrity of this important part of the foot.

**THE CUTTING AWAY OF THE BARS** in shoeing, through robbing the hoof of a couple of stays operating against the closure of its heel, conduces to its contraction. Nature gave the bars as a sort of abutment against either heel of the hoof to oppose its drawing inward, while the frog, placed between the heels, is operating in forcing them asunder; consequently, if the bars be removed, the expansive or counter-active powers of the hoof lose an agent they can in many cases ill afford to be deprived of.

**THE CONTRACTING EFFECTS OF HEAT AND DROUGHT** on the hoof may be guarded against by keeping the horse's stall free from fermentable litter, while the atmosphere of the stable is maintained cool without currents through it. The practice also of stopping horse's feet—or, what I believe to be better, of wearing swabs in the stable—will likewise tend to guard against the contracting effects of these agents.

We now come to the

**TREATMENT OF CONTRACTED FEET.**—The first thing to determine, whenever a case of contraction is submitted to us for treatment, will be, whether it be one of the pure or mixed description. If the former, the horse therefore not lame, and his feet be submitted to our inspection simply from the *apprehension* of his becoming lame, the contraction being on this account desired to be removed, the simple and best means of doing so will be to substitute tips for the horse's ordinary shoes, and to order that he stand with his contracted feet in cold water—or, what is better, in a bed of clay—for a couple of hours once or twice a-day, he being allowed to lie down as usual at night. By such a simple plan of treatment as this



will his hoofs, give sufficiency of time for Nature to carry out her operation, become restored to their pristine condition.

COLEMAN'S TREATMENT.—So much attention as the late Professor Coleman bestowed upon the foot of the horse, and so much experience as he had on contracted feet in particular, it would ill become us, on the present occasion, to be silent on what he has said on this part of our subject. "There are various modes"—I quote from his 'Lectures'—"by which contracted feet, in process of time, may be brought back to their original form, unless there happens to be a diseased frog. I do not mean to assert that the heels cannot be forced out by any other means than the frog; but I mean to say that this is the only means of effecting it without the aid of mechanical force. Perhaps there is no better mode than this of exhibiting the functions of the frog; for you find by giving it pressure you expand the quarters, since thereby you not only broaden the frog itself, but you at the same time give the new-formed horn an inclination to grow outwards. The expansion of the hoof is accomplished by the pressure upwards of the frog and the pressure downwards of the navicular bone. Seeing, then, that the frog, if pressed upon, will restore parts to a state of expansion which are contracted, it is conclusive to my mind that it performs the function we ascribe to it. The hoof I hold in my hand was once very much contracted, but the horse was turned out,\* and it became expanded again. By rasping the horn (at the heels and quarters), thinning the sole, and lowering the heels, and giving pressure to the frog, you expand the cartilages which project above the hoof, and thus force out the horn which thereabouts is as thin as paper, this thinning of the hoof increasing the power of the cartilages. And the operation is aided by the application of moisture to the hoof, which may be done by tying the horse up in a pond all day."

FOR EXPANDING THE HEELS BY FORCE, "there has been," continues Coleman, "an instrument recommended, by means of which they certainly have been dilated to a considerable degree,

\* Probably without shoes; or, may be, shod in tips.

consisting of a shoe having a joint at the toe, and a screw cross-bar at the heels, which are made with inside clips. I can readily imagine that this may be productive of good in some cases, *i. e.*, as far as opening the heels go; but there is less danger in bringing this about by a process of growth, and you are more likely to accomplish it effectually than through any mechanical operation."

THE REMOVAL OF CONTRACTION DOES NOT ALWAYS REMOVE LAMENESS. "Although," goes on to say Coleman, "we have had no difficulty in restoring the original form of the hoof, we frequently find we have gained nothing by it; nor could it be expected, unless we can at the same time restore the original structure of the parts contained within the contracted hoof. Contraction, by pressure upon the parts within the hoof, produces inflammation of the laminae and ossification of them. This accounts for the horse cantering or galloping instead of trotting, and so avoiding coming down with his heels upon the hard ground, and thereby experiencing concussion, arising from want of elasticity in the laminae; so that (although the contraction be removed), if the horse comes to be worked, he will fall lame again. In nine cases out of ten of what we term *groggy* or *founded* horses, these parts, in consequence of chronic inflammation, have become altered in structure, effusion of lymph or bony matter having taken place.

THE GRAND POINT AT WHICH I AM AT ISSUE WITH COLEMAN is, that instead of contraction of the hoof producing inflammation of the foot, in my opinion it is the inflammation that gives rise to the contraction. I believe, as I said before, *pure contraction*, *i. e.*, contraction without any disease of the foot, to be a comparatively rare occurrence. In my opinion inflammation is first set up in the foot, and then, from the organ not being in a condition for use, contraction befalls the hoof—in certain horses, but not in all, or in all to the same degree. A foot laid up out of use, or but as little used as possible—which is the case when the horse stands constantly *pointing* with it, or by going lame bears upon it as lightly as he can in trotting or walking—will gradually grow contracted; and this change in it will be promoted by the foot being naturally of an oblong

shape, of strong fibre, of upright make, with high heels, and a frog either actually diseased or so shrunk and shrivelled that it has no chance even of touching the ground, much less of receiving any pressure from the surface.

THE TREATMENT OF MIXED CONTRACTION is altogether a different affair from that of pure contraction. Here we have lameness and inflammation to encounter, or we have lameness with inflammation passing or passed away, dependent upon some effects it has left behind it, which is a worse case to deal with than the former one. In point of fact, we have a complication of navicularthrititis, or some one or other of its consequences, with the contraction; and for want of this knowledge about navicularthrititis it was that Coleman erred in his views and treatment of contraction. The navicularthrititis, *i. e.*, any existing inflammation, must be dispersed; and while we are effecting this, the shoe being off the foot altogether, or, at a proper period of the treatment a tip being substituted for it, the contraction of the hoof will by degrees give way to the return of the natural powers restorative of original formation. It is quite surprising how perpetually in operation these efforts are, in spite of the manifold impediments continually opposed to them, and how they, to the very latest period of time, return to restore primitive form, though the reparation of structure be impossible.

MY USUAL TREATMENT for a case of mixed contraction is this:—I first bleed from the toe of the lame foot, repeating the operation if requisite. I keep the foot, without shoe, immersed in cold poultices, until by the bleeding and them together I have brought about a manifest decline of the inflammatory action. I then put a tip upon the lame foot, and blister the pastern, and often the fetlock along with it. When the blister is worked off the horse is turned into some situation—either a marshy pasture or a mucky strawyard, or some shed where his foot or feet can be kept for a few hours daily in a bed of clay, care being taken, while he remains turned out, that the tip be removed every three or four weeks, or should he have cast and lost his tip, that the wall of the shoeless hoof be kept rasped down, lest he should break away or

crack the horn, and so render his feet incapable, when taken up, of having shoes nailed to them. From two to three months at least should be allowed the horse from the period of his being turned out.

## SANDCRACK.

THE NAME OF SANDCRACK seems of questionable application. It is evidently a compound of the words *sand* and *crack*, as though it denoted a crack with sand in it, or a crack occurring in a sandy country, or in a dry sandy season, which several derivations have been ascribed to the term. May not the word *sand* admit of resolution into its primitive signification, and mean in this, as in other instances, a *sundered* crack ?\*

A SANDCRACK MAY BE DEFINED to be a longitudinal division in the fibres of the wall of the hoof, amounting to a flaw simply, or else to a cleft or fissure through the substance of the horn.

THE DIRECTION OF THE CRACK is slanting, from above downward, and from behind forward, following the course of the fibres of the hoof. A sandcrack in the side of the wall slants more than one in front, owing to the great obliquity of the course of the horny fibres as we proceed from the toe to the heel of the foot.

THERE ARE TWO KINDS OF SANDCRACK, *quarter sandcrack* and *toe sandcrack*: the former occurring in the fore, the latter in the hind foot. At least this is generally the case. It is rare to find the reverse; though there are occasions on which we meet with sandcrack in the toe of the fore foot, and the quarter of the hind foot. It is possible for cracks to occur in other parts of the hoof; but in these two situations

\* The Anglo-Saxon *Sundrian* or *Syndrian*, to *sunder*, presents an obvious origin for *sand*, which is *sundered* or separated into the smallest particles.—‘Richardson’s Dictionary.’

it is that veritable sandcrack occurs, and there are here, as we shall find hereafter, special causes for their production. Let us first consider

*Quarter Sandcrack.*

THE SITUATION OF THIS CRACK is the slanting line of the wall of the hoof, directly opposed to the extremity of the *ala* of the coffin bone; and it is oftener found in the inner than in the outer quarter. Added to which, the hoof in which such crack occurs is always a contracted one: quarter sandcrack, no more than toe sandcrack, never happened in a hoof disposed to openness and flatness. The same description of horse and foot which is predisposed to contraction is for the same reasons predisposed to sandcrack. There is an obvious connection between contraction and quarter sandcrack. The light, near-the-ground stepping horse, with strong, narrow, upright hoofs, will be equally likely, under certain conditions, to have the heels of his fore hoofs becoming contracted, and exhibiting quarter sandcracks. Hot stables conduce to this; but more still hot climates. Hurtrel D'Arboval informs us, that at the time the French Army were in Egypt their horses were continually having sandcracks; and he adds, that long voyages on board of ship are on occasions attended with like results.

THE PROXIMATE CAUSE OF QUARTER SANDCRACK is, then, *contraction*. The horn, from dryness or other cause rendered cracky and fragile, breaks at the quarter of the wall, from being at that part bent across the edge of the *ala* of the coffin bone, during the curving in of the heel, the result of contraction; and this oftenest happens to the inner quarter, from its being the thinner and weaker one, as well as from being the one which is the first and most disposed to contract. Not that sandcrack is the necessary consequence of contraction; but that contraction becomes a necessary precursor to sandcrack. If this were not the explanation of the case, sandcrack would be as likely to occur in any part of the wall as at the quarter, and on the outer as often as on the inner side of the wall.



This likewise accounts for the comparative infrequency of quarter sandcrack at the present day among our nag and cavalry horses, since that which has tended to diminish the frequency of contraction has had the same effect in regard to the occurrence of sandcrack. Greater attention to shoeing, and increased care about the condition of the hoof itself, has no doubt had very beneficial effect in the prevention both of contraction and sandcrack.

THE ORIGIN OF SANDCRACK IS USUALLY SUDDEN, both in the fore and hind feet; though in the former case, from its situation in the inner quarter, a part not exposed to transient view, it is possible for a crack to exist for some time, unless lameness happens to arise from it, without being discovered. The crack first takes place through the superior or coronary border of the hoof, that being composed of new-formed horn, which is thin and fragile. Quickly it extends downwards, through the thickest part of the wall, stopping, as it does in some instances, at least for a time, half way down, and afterwards reaching nearly or quite to the bottom.

SANDCRACK IS EITHER PENETRANT OR NON-PENETRANT. It is usually *penetrant*; by which we mean, the crack extends completely through the thickness of the hoof, and produces lesion of the sensitive parts underneath the horn, giving rise to some little hæmorrhage in the first instance, and subsequently to more or less inflammation; occasionally, even to suppuration; depending, of course, on the extent and nature and duration of the lesion, as well as on any treatment, or aggravation from non-treatment, it may have received since being occasioned. When the crack does not extend through the substance of the wall—which it sometimes does not at first, though it may do so afterwards—it may be said to be *non-penetrant*. And this, when it happens, seems to be referrible to a sort of natural fusion—there certainly exists between the solid horn, as it descends from its secreting gland, the coronet—and the horny laminæ, which become glued to it in its course downwards. It is in this uniting horny medium that *seedy toe* commences and progresses.

LAMENESS IS THE USUAL ACCOMPANIMENT of penetrant

sandcrack, but not the invariable one. In this case, the lameness is said to arise from the sensitive laminæ getting *pinched* between the sides of the crack. However this may be, inflammation following the lesion has certainly its share in causing tenderness or pain during the action. In general the lameness does not amount to much, nor is it of long duration, providing the sandcrack receive proper and timely attention; but if the crack is not heeded, action of the foot will much aggravate the malady, and end in lameness increased so much as to forbid further use being made of the animal.

### *Toe Sandcrack.*

Occurring in the hind foot—as this crack almost invariably does—occupying a different situation in the hoof, and arising altogether from a different cause, toe sandcrack may be regarded as almost a distinct affection.

THE SUBJECT OF IT is not the light horse, but the heavy one. The cart and waggon horse, the dray horse, the latter especially, and in particular, I believe, in paved towns such as London, are the sufferers from this disease. I say “sufferers,” because it is only those veterinary surgeons whose practice lies among horses of this description that have any conception of the amount of pain and irritation to which toe sandcrack, simple as it may seem to those who are in the habit of meeting with quarter sandcrack only, on occasions is found to give rise.

THE CAUSE OF TOE SANDCRACK is violence: shoeing, also, may have something to do in its production. The horses who are the subjects of it are those employed in laborious and straining draft. The toe of the hind foot is the main fulcrum through which the hind limbs, the propellers of the body, exert their power; and it is in some violent and forcible effort that the hind hoof, strained at the time to its uttermost, and in particular at the toe, splits; commonly first at the coronet, the same as in the fore foot, where the horn, but newly formed, is thin and unresisting: the crack subsequently extending

gradually down the wall, even as far as the point of the toe. Digging the tip of the toe into the ground, or stamping it hard down upon the pavement, and especially when this stress upon the fore part of the wall is, standing or going, promoted by high caulking to the shoe, must certainly, one would think, be the exciting cause of toe sandcrack; an opinion still farther favoured by the observation which has been made of *shaft* horses in drays being more subject to the accident than trace horses. Still, however, for all this, it behoves me to say, that with the best judges of such matters, the point is one not yet freed from doubt and difference of thinking. Short and upright pasterns, with clubby prominent hoofs, indicate a predisposition to toe sandcrack, the disease being in no instances seen in flat, shelvy, spreading hoofs. It is said, sandcrack may originate in *tread*. Undoubtedly, any lesion of the coronary body sufficient to injure or destroy its secretory apparatus may occasion imperfect or morbid formation of horn, or loss of horn altogether; but I do not believe this to be a very common course of sandcrack.

THE CONSEQUENCES OF SANDCRACK IN THE HIND HOOF are, as I have before hinted at, apt to be of a much more serious nature than any usually arising from a quarter sandcrack. Whether the crack extend to the extremity of the wall or not, being uniformly of the *penetrant* description, lameness to greater or less degree is the invariable result. And when the fissure does reach down to the toe, the divided wall opens and exposes the laminae, and probably the whole way from the coronet downward, the consequence of which is inflammation and suppuration of those parts, and sometimes even mortification and sloughing of them; and not of them alone, but of the bone to which they are attached as well, which not infrequently runs into a state of caries, ending in defalcation of substance, to be filled up by the effusion of callus, and usually terminating in exostosis, coated with some tissue very imperfectly representing the original laminated structure.

Mr. BRABY, the intelligent veterinary surgeon to Messrs. Barclay and Perkins' establishment, to whom I am indebted for much of the information I possess on this part of my sub-

ject, has had many cases of this description, one of which, of extraordinary character, I shall relate here. One of his dray horses had suffered long and severely from toe sandcrack in one hind foot, but at length had recovered, and returned to work. Some time afterwards, however, during the season of influenza, he was attacked with a violent laryngitis, which increased to a degree to call for the operation of tracheotomy, to save him from suffocation. Notwithstanding this temporary salvation, however, the patient in the end succumbed to the disease. His post-mortem examination became doubly attractive, owing to the circumstance of the long-standing and obstinate sandcrack he had suffered from heretofore, and the result in this latter respect proved extremely interesting. The coffin-bone, along its front, occupying the line of surface between the coronal process and the toe, exhibited a channel of loss of substance half an inch in breadth and fully the same in depth, thereby robbing it of a quarter of an inch of its solid thickness. This, of course, left the bone considerably weakened, the result of which subsequently was, transverse fracture in two places through its body; the fractures commencing upon its articular surface, whence they extended directly, crosswise, through the middle of its body, so as to become apparent upon its concave surface underneath. In addition to this, growing from the laminated interior of the wall of the hoof, opposite to the middle or deepest part of the channel in the coffin-bone, is a projection of hard, horny, callous substance, having a covering of imperfectly formed horny laminæ. The horse suffered in the greatest degree from this extraordinary product of sandcrack; indeed, constitutional irritation at one time ran so high as even to create alarm for the animal's life.

THE TREATMENT OF SANDCRACK, whether it be in the quarter or in the toe, will have to be conducted upon principles applicable to both forms of the disease; though one must be regarded as of much more consequence than the other.

THE TREATMENT OF A QUARTER SANDCRACK, generally speaking, is but, comparatively, a simple affair; indeed, so lightly is it looked upon by horse persons in general that we should run some risk of their disapprobation, and our own

reputation as well, were we to talk about laying a horse up for so "trifling" an accident. Nay, some horses, with non-penetrant sandcracks, or with sandcracks that have been penetrant but have become horned over, showing little or no lameness, continue to work on without, at all events for some time if not for always, evincing any pain or inconvenience from them. Whether a horse be lame or not, however, should he have a sandcrack, and we be consulted about it, it becomes our duty to arrest the extension of the crack so long as it be but partial; and, besides that, to take measures for the "cure" or permanent removal of such crack. The owner of the horse should be given to understand, that no flaw or crack in the hoof can by possibility unite the same as a wound in a vital part does; but must, as the saying is, "grow down," *i. e.* must be replaced by new horn, and be itself by degrees removed, as it continues to come under the operation of the drawing knife every time the horse is fresh shod. So that, in point of fact, the "cure" or obliteration of sandcrack is necessarily a work of some months; though the removal of the lameness consequent on it may possibly be accomplished in as many hours or days.

PARING OUT THE CRACK, the shoe being taken off the foot, is the first thing to be done. The cutting cautiously away of its rugged edges, and the scooping out with a light hand—probably with the back of the drawing knife—of its cavity, will enable us to examine into the condition of it. Should there be no lesion nor exposure of the laminæ detectable, nothing further will be needed from the drawing knife than the cleaning out of the crack.

FIRING THE CRACK is the next operation. Cross-firing will be advisable below or above, or in both situations, according to circumstances. So long as the crack has not reached to the bottom of the wall, it will be requisite, with an ordinary firing iron at a red heat, to burn a deep but short fissure or "mark" across its lower extremity; and whether a similar operation be required across the superior termination of the crack must depend upon its extension or not through the horn at the coronet. If there be any interval of sound horn between the hair and



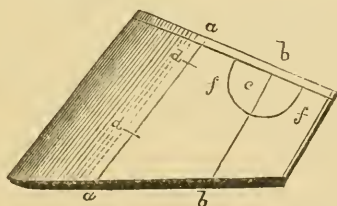
the crack of sufficient breadth and substance to bear firing, a very slight burn may do good. In all cases it is the practice to finish the firing with running the sharp edge of the iron down the crack; and this certainly proves beneficial in destroying any tendency there may be—supposing the laminæ to have become denuded—to anormal action, as well to stimulate any vascular parts exposed to issue horny matter to cover in the bottom of the crack.

BINDING UP THE CRACK is a good practice after firing. With a wax-end of sufficient length—such as shoemakers use—bind round the wall of the hoof, so that any tar or pitch plaster it may be deemed advisable to place in or upon the crack may be maintained there; at the same time that the hoof itself is, by the tight binding, restricted in any tendency it may have to expand, and thereby open wider the crack.

A BAR-SHOE is the preferable one for a sand-cracked foot. By it, the bearing being taken off that part of the wall which is opposite to or has the crack, the pressure and jar—so continually splitting afresh the new-formed horn over the crack at the coronet—is put a stop to: the formation of an undivided coronary horny band being the commencement of the radical cure of the sandcrack. As I said before, horn being an inorganic substance, no union whatever can take place in the crack itself: permanent cure can be effected only through obliteration by the growing out or down of the crack. This, I repeat, is the reason why a sandcrack occupies so long a time in its removal; though, by way of compensation, a horse is not kept out of work while cure is being effected; for, after the crack has been bound up, and the hoof shod with a bar-shoe, it is quite surprising to find how soundly and firmly the animal sometimes steps upon the foot of which he had but now been so lame.

THE TREATMENT ADOPTED BY THE LATE MR. READ, V.S. of Crediton, carries the same object into execution through a different method of procedure. This, as detailed in the volume of THE VETERINARIAN for 1848, consists in simply isolating the fissure within the segment of a circle, by means of an ordinary firing-iron. The plan Mr. R. recommends is to

operate with the heel of the iron, beginning at the coronet with either extremity of the segment, and bringing the firing to a finish at the centre. The iron should be at a strong red heat, and be carried through the horny crust, until it touches, lightly, the sensible laminae, and so throughout the entire semicircle. As you recede from the coronet, so in proportion you will require to deepen the fissure in the crust. The iron ought to be reapplied every week or ten days. The first effect desirable to be produced is a bulging of the crust around the coronet within the segment; and when once this is fairly established, the cure may be said to be effected, it being seldom necessary to apply the cauterizer afterwards. The old method of making a line with the iron across the fissure cannot prevent the opening and closure of the fissure during the action of the foot; whereas, isolating the fissure (or part of it) within the segment of a circle, completely effects the object. No tarcord or strapping or alteration of the shoe is required to limit the motion of the crust, all motion being suspended within the segment, and especially after bulging has commenced. The subjoined woodcut will explain the old and new method of operating with the firing-iron.



*a a* A sandcrack intersected at *d d* by transverse firings.

*b b* A sandcrack isolated (in part) at *c* by semicircular firing *f f*.

THE OBJECTS OF TREATMENT, after what has been stated, will clearly appear to be—first, to place the hoof in such a condition as shall not render it liable to crack afresh; secondly, to remove that state of it which, in the first instance, disposed it to crack, if it were not of itself the immediate cause of the cracking. The way in which the first object is to be effected has been already shown; and when this has become accomplished, past all risk of return, we may set about to bring into

effect the second. A bar-shoe, from its taking the bearing off the quarters and placing it upon the frog, will in a measure give facility to what we now are desirous of promoting, viz., the expansion of the heels of the foot ; but a tip—providing it can be worn, which it frequently may with great advantage after a bar-shoe—will bring about greater reform still ;—will, in fact, by persistence in its use, bring about in time that improved form of hoof which will be no more liable to sandcrack.

THE TREATMENT OF TOE SANDCRACK is in some respects a different affair from that of quarter sandcrack. This disease is not only different in its relative situation as regards other parts of the foot, but it arises, as we have seen, from a totally different causation. When once it has occurred, it becomes, compared with the other, a serious affair. The horse is lame, too lame to continue his work probably : and we have a penetrant crack to deal with, extending all or nearly all the way from the coronet to the toe ; discharging blood, or perhaps matter of some ichorous offensive description, plainly calling upon us for, not simply binding up, &c., as in the former case, but for

OPENING AND CLEANSING AND DRESSING. The shoe being taken off, let the crack be pared out and freed from all horny rags and asperities, and laid completely open to view, so that the bottom can be inspected and dressed with whatever may be deemed requisite. In fact, when once the fissure is dilated into a clean and open channel by the operation of the drawing knife, warm baths or poultices, or dressings of any kind, according as may become necessary, are applicable ; the case being in this stage no more than one of dilated sinus of the foot, similar to what might in another situation be called *quittor*. As with quarter sandcrack, the cure will, of course, be tedious in its duration, since we know that all complete repair can come only from the coronet. The sensitive laminæ having the power of secreting horny laminæ, may, as in the quarter crack, issue a sort of horny covering-in of the bottom of the fissure ; but still the fissure will remain so long as an integral formation of horn does not grow down from the source of secretion.

WHENEVER THE HORSE IS IN A CONDITION FOR WORK a bar-shoe, so made that at the toe it remains open or unjoined together, the interval left being of sufficient width to receive the crack in front of the hoof, is perhaps the best. Binding the hoof up with circles of wax-end, as in the case of quarter sandcrack, with some adhesive plaster and dressing underneath it, will also now become advisable. It will restrict the expanding inclination of the hoof, as well as keep dirt and wet out of the crack. Repetition of this, and the continuance of the bar-shoe, will be required so long as there appears any risk of extension or renewal of the crack.

## CORN.

We have seen that *contraction*, out of which results sandcrack, is a product of shoeing: another disease ascribable to the same cause is *corn*.

THE NAME of *corn* no doubt has been borrowed from human medicine; perhaps because *pressure* was found to be the cause, or, it might be, because there are corns in the horse over which the horn grows exceedingly thick, the same as the cuticle does over our own corns. So far identity of name is warranted; but if the comparison be carried further than this, misconception will certainly result: corn in a horse being, pathologically regarded, quite a different disease from human corn.

DEFINITION.—A corn consists in contusion of the sole of the foot, producing *ecchymosis* or extravasation of blood, which permeates the pores of the horn, and turns it red; or it may consist in a collection of purulent matter in the part, in which case it is denominated a *festered corn*.

THE SEAT OF CORN is commonly the angle of the sole of the *fore* foot;—the *angle* meaning the part included between the heel of the wall and the bar;—and the *inner* angle is more frequently its seat than the outer; reasons for which predilections will be given hereafter. A contusion in any part of the sole is, pathologically speaking, a *corn*, though we are not in the habit of so calling it. The French veterinarians



have different names to denote the two kinds of corn : they call our proper corn *bleime* while the other they designate *foulure*. In fact, altogether, they distinguish *four* different corns :—the *foulure*, or bruise of sole from tread ; the *dry*, the *moist*, and the *festered corn*.

PREDISPOSITION TO CORN exists in broad, flat, weak feet, with heels so low, or curved in, as not at all or hardly to project beyond the level of the sole. In such feet there is a great tendency, from obliquity and weakness of foot in the wall, to spread at bottom, and over-shoot, as it grows down, the heels of the shoe : unless those parts of the shoe are—as they ought to be in this kind of foot—made wider than the hoof, to allow for such spreading. The result of this over-shooting, or, as it is called by the smith, “eating of the shoe into the foot,” of necessity is, to bring the heels of the shoe opposite to and down upon the sole, and this, especially when the horse is “shod short,” is likely to end in contusion of the part and corn. Indeed, from the springiness and thinness of the wall in such feet, and from its growth hardly exceeding its wear and tear, considerable pains in shoeing are frequently required to keep them free from attacks of corn, and particularly when once they have suffered from the disease, and are in the habit of experiencing relapses. After a statement of this kind, we shall not be prepared to find corns coming in feet of the very opposite character, viz. contracted feet. Such, however, is the case ; though in them corns must certainly be ascribed to another class of causes.

THE CAUSE OF CORN is, any impediment to the yielding or elasticity of the sole of the foot, whereby the sensitive tissue becomes contused and bruised between the coffin-bone above it and the horny sole below it. The shoe is usually the offending body ; though it is possible for a stone, or dirt, or gravel, or any thing else, by lodging between the shoe and the sole, to produce the same result. A shoe, from being of improper shape or make, or from being improperly put on, in time “eats its way into the foot,” and gives rise to corn by lying against the sole, and so proving an impediment to the yielding or “descent” of the latter during action, under the weight or force applied upon it. If the horny sole cannot



yield, the organic tissue must suffer compression, if not actual contusion, every time the coffin-bone is forced down upon it; and this is likely to occasion rupture of some of the delicate blood-vessels distributed through its papillary texture, whence results extravasation of blood (*ecchymosis*) and consequent staining of the portion of horn opposed to the bruised part. This is the ordinary simple origin of corn. It is a rare occurrence in the *hind* feet, because hind shoes are made long and substantial at the heels, have indeed often calkins worked upon them; and because horses tread with their hind feet with more force upon their toes than upon their heels. The fore feet, on the other hand, are the peculiar, almost exclusive subjects of corn, because in them the shoes, being apt to be short and close fitting at the heels, are more liable to eat their way into the sole, and because their soles yield or "descend" more at the angles, in consequence of the fore feet having to support more burthen than the hind, and having in action this greater weight thrown directly upon them. The same reasoning will apply to the inner heel of the fore foot, to account for its being oftener the seat of corn than the outer. Also, from the inner heel of the shoe being usually made a closer fit than the outer, in the case of any dilatation of the hoof it becomes more likely to slide inward upon the sole: added to which, the inner heel is weaker and less able to bear weight than its fellow, although it frequently has to support more.

That faulty shoeing is the chief and predominant cause of corn cannot anywhere receive more satisfactory demonstration than in the Army. Corns and quittors and contracted feet were, in former days, as rife in the cavalry as in other places; whereas, at the present day, these diseases are all but unknown to veterinary surgeons of regiments. And all is owing to an amended practice of shoeing. In the late Professor Coleman's Lecture on the subject, delivered in the year 1809, I find the following passages:—"There are very few horses that are not attacked with corn"—"This is so common a disease that nine hundred horses out of a thousand have it." What would be thought of a veterinary lecturer making such observations at the time present? Proof as this is of the share bad or im-

proper shoeing has had in the production of corn, it is not to be denied that

OTHER CAUSES exist. Contracted feet are known on occasions to generate corns, and in them corns cannot be said, but by accident, to owe their production to shoeing. In these cases, it would appear that the sole, from growing thick and unyielding, or possibly from its becoming anormally concave at the angles, offers the impediment to the descending tendency of this part of the foot, and thus occasions, the same as the shoe would, a bruise, between the horny sole and the coffin-bone, of the sensitive sole. Most writers, however, attribute this to *lateral* pressure, resulting from contraction; which, in fact, is making contraction a cause of corn. Both Blaine and Youatt ascribe it to what they term "wiring in" of the heels of the wall; though I cannot see, myself, how this can operate in the production of corn, unless it be through the contracted heels rendering the angles of the sole fixtures.

THE PATHOLOGY OF CORN will vary with the stage it happens to be in at the time. A recent corn consists in no more than an *ecchymosis* or extravasation of blood, the consequence of violent compression or contusion of the villous tissue of the sensitive sole. Should the blood have transuded, as it commonly does more or less, into the pores of the horn, whenever the shoe is taken off the foot, redness of the part will render the corn apparent; though now and then the corn-place requires to be scraped or pared out with the drawing-knife before the discoloration becomes visible. The red stain may amount to a broad patch, or only to a spot or marbled surface; and the dye, though ordinarily red, may assume a brownish or even a blackish cast; or, it may so happen that there is hardly any or no blush at all to be seen. But, on the contrary, there may be softness or bogginess of the horn over the part, owing to its being soaked in a serous or ichorous issue: this constituting a *soft corn*, in contradistinction to the other, which may be denominated a *hard corn*; since in the latter the horn is not only often thick, but dry and hard over it.

A FESTERED OR SUPPURATED CORN ordinarily indicates an

advanced stage of the disease ; though it is possible a corn may take on suppuration from the very beginning. In the usual course, in consequence of inflammation, serous issue succeeds to extravasation, and afterwards pus is secreted ; or the two effusions may be present together, producing a sero-purulent discharge. This condition of corn is commonly owing either to neglect or to aggravation of the primary stage of the disease. The horse, though evincing tenderness or even lameness, has not had, as he ought to have had, his ailing foot attended to ; and the consequence is, abscess of the part, which would but for this negligence or aggravation have remained in the state of ecchymosis. When this is the case, the shoe is no sooner pulled off, and the pincers, or even the thumb of the smith, applied to the site of the corn, than the animal flinches to that degree that he quite rears up with the exquisite pain the pressure gives him : a token at once expressive to the veterinarian of the true nature of the case. He feels quite assured there is matter present, and he insists on the corn being pared until vent be given to it. In doing this, discovery is commonly made of the pus having, to a greater or less extent, under-run the horny sole at the angle ; which renders it imperative for the horn to be taken away wherever it is found detached, leaving exposed the surface of the living tissue, more or less altered in character according as the matter has been long pent up or not, and according as the corn be a recent or a chronic and relapsed one. Indeed, when matter has been long confined from being unable to obtain any outlet below, it on occasions makes its way upwards, contrary to gravity, and breaks forth at the coronet, and in this manner the case turns to a quittor.

LAMENESS is commonly the symptom which leads to the discovery of corn. A horse is found going gingerly upon one or both fore feet, or actually lame ; and this induces an examination of his lame foot, when the heel of the shoe is detected pressing upon the sole in the seat of corn. Or, the lameness may arise from the horn growing thick and hard over an old corn. Or, lameness on a sudden may become excessive ; in which case we may expect, knowing the horse has corns, to find a festered one. Lameness arising from

corn is known to be at once relievable either by removal of the exciting cause, as in the case of the pressing shoe ; or by the liberation given to the matter collected, as in the case of festered corn ; though, in the latter instance, some continuance or relapse of it may not be unexpected during the healing and horning-over process.

THE TREATMENT OF CORN is as much an affair of the farrier as of the veterinary surgeon ; indeed, in its unsuppurated condition, and especially in its chronic stage, it may be said to be especially within the province of the former. Supposing the corn to be recent, and pressure from the shoe to be the occasion of it—which may be reasonably inferred to be the case if the heel of the shoe be found lying upon the corn-place—simply taking off the shoe, and replacing it by another of suitable make, so applied that it will not only take any bearing upon the corn-place, but will protect it from future pressure and injury, will be all that will be required to cure the ailment, or, in other words, to restore the horse from a state of lameness to one of soundness.

PARING OUT THE CORN, as farriers phrase it, becomes the first requisite operation as soon as the shoe is removed from the foot. The thumb of the smith, sometimes his pincers, is applied upon the corn to ascertain its condition—hard and unimpressible, soft and boggy, or springy and fluctuating, as the case may happen to be ; and if it be found in a state in which no impression can be made upon it by the thumb—from the horn over it being thick, or dry and hard—the *paring*, consisting in skilfully shaving the horn away in as thin flakes as possible, so as not to endanger cutting through the corn, commences : the operation being ever and anon suspended for a moment to admit of the re-application of the thumb, to ascertain what substance of horn may yet remain. In a corn in a strong narrow foot, having a thick coating of horn, a good deal of paring will be required before this effect is produced ; on the contrary, when the foot is a flat and weak one, with sparingness of wall and sole, the utmost caution in paring, and frequent thumb-feeling, will be demanded, lest the drawing-knife should slip through the thin substance of horn. When extensive ecchymosis is present, so that the flakes of



horn come away deeply stained red, we may expect, sometimes in recent corn even, to find a soft or boggy condition of the bottom of the corn, where the extravasated blood has not yet soaked through, or become inspissated and dried. Should this be found to be the case, the paring must be suspended, and the foot, after being immersed in a warm bath, be dressed with some astringent or mild escharotic—such as a solution of alum or the sulphate of copper—for a day or two, which will dry the corn up before the shoe be re-applied. The paring of the corn being completed, it is mostly advisable to uniformly thin the remaining parts of the sole as well, which will likewise tend to give ease; though in the case of the flat foot but very little, or perhaps no such reduction of substance may be called for.

THE SHOE PROPER FOR A FOOT WITH CORNS must be made to serve the purpose of protection to the corn-place, while it bears upon parts of the hoof which in nowise, either directly or indirectly, communicate pain or uneasiness to the corn from the pressure they receive from it. A shoe may not positively press upon the corn-place, and yet occasion tenderness or lameness by bearing upon the junction of the wall and bar at a time when these parts are not in a condition, from their contiguity to the corn, in the sensitive state it is left in after being pared, to endure it. At the same time, a shoe, though it have no offensive bearing, is faulty unless it be so shaped that it defend the corn-place from contusion or other injury, from stones, gravel, dirt, &c. Providing there be solidity and thickness and depth of wall enough to give it firm bearing, I know of no shoe better adapted to answer our purpose than Plomley's broad-webbed one, made flat upon the foot-surfaces of the heels, or, if required, chambered out there. This shoe will afford the broadest cover and protection, and at the same time take such flat and solid bearing upon the heels as will render it impossible for the corn-place to sustain any pressure from it in the course of the limited time—say three or at most four weeks—any shoe ought to remain on a foot with corns. But when the heels of the hoof are weak and low, not projecting perhaps beyond the frog, while that body remains sound and prominent, a bar-shoe is to be preferred. This



shoe will, by taking a bearing upon the frog, not only save the heels from wear, but at the same time tend much to relieve the corn—or corns if there be two—by bearing but comparatively lightly upon the junction places of the wall and bars, parts so immediately related to the corn-places. In fact, in a case where an ordinary shaped shoe does not relieve tenderness of going, a bar-shoe, of all others, is the most likely to answer. Be the horse, however, shod how he may, no shoe should be worn by him longer than he appears to go soundly, or at least painlessly, in it: from the moment any lameness or even tenderness becomes apparent, more than existed formerly or than we have reason under the circumstances to expect, the shoe ought to be taken off, and the foot re-inspected. The shoe may be found pressing unduly upon parts near the corn, or even upon the corn itself, or some dirt or gravel may have worked its way underneath the heel of the shoe, and that may be irritating the corn. When this latter accident seems likely to happen, some soft stopping, mingled with tow, inserted underneath the shoe, so as to give a cover to the corn-place, will be found of advantage; and now and then, a leathern or gutta-percha sole under the shoe has been found serviceable. Such expedients as these must, of course, depend for their employment on circumstances, and be regulated by the judgment of the veterinary practitioner. All that I have hitherto said on treatment supposes that the horse having corns is to be returned—or rather is in a condition to be returned—to his work. This may not, however, be the case.

**THE CORN MAY NOT ADMIT TO RETURN TO WORK.**—The horn may prove to be under-run, serous or purulent fluid may have collected, and this will necessitate the exposure of the morbid secreting surface.\* Instead of being simply thinned by paring, the horn in the corn-place will have to be cut out with the drawing-knife—re-union of horn once detached being what never happens—so as to admit of dressings being applied to the exposed tissues. Generally, however, in such cases it is advisable, particularly if there exist any signs of inflammation, to wrap the foot in a poultice for a day or more, according as the corn shows a disposition to assume healthy

action, and to continue the poultice so long as the secretion of horn thrives under it. From the moment, however, that the surface of the sore loses its ruby granulating character, or that serosity in place of horn issues from it, the poultice ought to be discontinued, and slightly escharotic dressings substituted, such as solutions of the sulphates of copper, zinc, alum, &c., which, should stimulants appear called for, may be succeeded by the compound tincture of benzoin or myrrh. As soon as we have succeeded in permanently drying up the surface, and have established a normal secretion of horn, at the time that we are still applying dressings to complete the cure, the patient will benefit by being sent to work: pressure upon the corn doing good so long as it is no more than tow or any other soft material will give, providing dirt and wet be kept from it. To this end, after placing upon the corn a dossil of fine tow dipped in the dressing, lay another thick dossil of dry tow over this, then nail the shoe on over all, the broad heel of which will give the requisite support. A leathern or gutta percha sole may be used if deemed serviceable. In either case, care should be taken to remove the shoe, during the first week or so, every third or fourth day, in order to ascertain the state of the part, and renew the old or apply some fresh dressing, according as may seem to be indicated.

SUPPOSING THE CORN TO BE IN A CONTRACTED FOOT, and there be reason for believing that it is anywise connected, either in causation or in duration, with the state of contraction the hoof is in, no shoes will prove so beneficial, when once the corns, supposing them to be in a state of sore, are horned over and able to bear pressure, as *tips*: the heels of the hoof being left, during exposure, at their full natural height.

PREVENTION OF CORN.—After what has been stated, it must be obvious that the prevention of corn is to be sought in the forge—that, in fact, it consists in proper shoeing. Coleman, in his “Lecture” on the subject, from which I have already made an extract or two, virtually acknowledged shoeing to be the producer of corn when he said to his pupils—“But I will venture to say, if a horse continue to be shod under your care, *he will never have a corn.*” The shoeing, therefore, which

gives rise to corn is faulty, and the correction of its faults has proved the prevention of corn. Not much heed has been taken of either the morbidly thick sole or of contraction as causes of corn, and yet has corn been got rid of. This is tolerably convincing proof that shoeing, if not wholly, at least in the great majority of cases, is in fault. Therefore to shoeing let us look for our prophylactic. To shoeing, indeed, we have looked, and in shoeing we have found our preventive: the main consideration being, that no shoe be of a shape, or be so nailed upon the foot as to endanger its heel coming down, presently or remotely, upon the seat of corn.

#### SEEDY TOE.

DEFINITION AND NAME.—This is a disease of foot consisting in a mouldering away, as though through decay, of the toe of the hoof, the horn whereof, on being scraped with any hard body, or even picked with the finger nail, crumbles into minute fragments, which seem to have been regarded as bearing some resemblance to garden *seeds*, whence it would appear has been derived the appellation of *seedy toe*.

VETERINARY WRITERS ARE STRANGELY SILENT ON THIS SUBJECT. Either they appear to have regarded it as one too insignificant to engage their pens; or else they have found it, on investigation, simple as it seemed to be, to be involved in more intricacy than they had calculated on, and so have abandoned it to future inquiry. In none of the veterinary works I have consulted have I been fortunate enough to meet with any account of seedy toe.

THE ORIGIN AND PROGRESS of the disease before us is worthy our best attention, not only as being the most likely means of showing us how such a case had best be managed, but as tending to infuse light into a department of veterinary pathology manifestly in want of cultivation; since from all that I have been able to learn, some of the most eminent practitioners, up to the hour I am writing, seem hardly to have given the subject a thought; while others, who have thought about it, entertain very different opinions. In its incipient stage, when nothing more is to be seen than a sort of *dry rot*

of the horn of the toe, the farrier, on the occasion he is about to fresh shoe the horse, is the most likely person to discover the disease. He finds the horn opposite to the extreme toe, at the line of junction between the wall and sole, so "rotten" that it will no longer sustain the bearing of the shoe, against which it has been firmly pressed through the clinch of the clip; but, on the contrary, crumbles away under his thumb, or even under the stroke of his hammer, leaving the outer crust no more than a hollow shell over the decayed part. The clip, in consequence, has no longer any counter-support from the shoe; and if the smith cut away all the rotten or dead horn, it is probable he may have to do this at the expense of considerable excavation of the wall: since, should the case be one of long standing, not only will there exist seediness of the toe, but the same decay of horn will be found to have eaten its way up between the outer and inner crusts of the wall, in a direction towards the coronet, creating a hollow large enough, perhaps, to admit the handle of a tea-spoon, though it may be no more than is sufficient to receive a horse-nail; depending, of course, upon the length of standing of the case, as well as upon the progress, rapid or tardy, the decaying process has been making. If we use whatever may be introducible into the hole by way of a probe, to ascertain the extent and direction of the cavern, we shall find the searching process to be attended with an issue of fragmentary dust of horn of the character that has been described. Even supposing the shoe were on at the time that seedy toe was suspected, tapping the front of the wall with the smith's hammer would, by the sound elicited, to a practised ear, pretty surely disclose the undermined condition of the hoof.

No LAMENESS attends seedy toe; none, at least, so long as the hollowness is not of that extensive and weakened character that portends sinking of the wall, which every now and then is the case. Whenever such ill consequences happen, however, as the descent of the weight of the body, from bend of wall, upon the sole, bulging and pumice of the latter inevitably follow, the same as from the effects of laminitis; and such results may supervene upon the injudicious removal of the excavated wall.



THE FEET ORDINARILY AFFECTED are the fore ; indeed, among riding and light draft horses they may be said almost *exclusively* to be so. But among cart and dray horses the *hind* hoofs are not unfrequently found seedy. Mr. Braby informs me, that in his (Messrs. Barclay and Perkins') establishment, he thinks the disease occurs somewhat *oftener* in the hind than in the fore feet. Along with other observable differences between horses of a light and heavy description, and between those working in and out of draft, it deserves here especially to be noted, that cart and dray horses are shod with strong broad clips to their *hind* as well as fore shoes ; whereas light horses in general have toe-clips to their fore shoes, but none to the hind, the shoes upon the latter being maintained by comparatively small clips aside of the toe.

CAUSE.—Were we certain about the *cause* of seedy toe, the step from cause to effect, and to the *nature* of such effect, would probably not be difficulty ; but here, in fact, commences our *vexato questio*. In order to display the wide extent and difference of direction of opinion on this main point, we have only to enumerate those we happen to be acquainted with of the theories concerning it. Seedy toe is said to owe its origin—I. To laminitis. II. To an affection of the laminae, having some analogy to *onychia* or *paronychia* in the human subject, whereby the secretion of the horny laminae is altered or suppressed. III. To the presence of animalculæ. IV. To hot shoeing. V. To pricks from shoeing, or to nails being driven too close, and thereby causing disease of the laminae. VI. To a deviation of the coffin-bone, and consequent descent of sole, thereby producing a separation of the outer from the inner crust and sole. VII. To pressure, either from the shoe or nails, or from both.

Our first inquiry had better be, whether or not seedy toe arises from, or is anywise connected with, *shoeing*. Mr. Ernes, whose explanation of the phenomenon is recorded under the sixth theorization, informs me, he has met with the disease in the *unshod feet* of the horses of Lithuania and Poland : countries where shoeing is so rarely practised as to be the exception rather than the general custom. Mr. Ernes adds, “ he has never had a case of seedy toe in the *hind* feet ;” and I



may add weight to this fact, by saying that, taking the last fourteen years of my servitude in the First Life Guards—during which period I find I have registered sixteen cases of the disease, viz. nine within the last seven years, and seven within the former like period—I do not remember to have seen a single one in the hind foot. Here, then, we have presented to us two attractive facts for our consideration: one is, the all but total absence of the disease in the hind feet of horses of the light or ordinary description; while in heavy draft or dray horses it occurs as often—Mr. Braby calculates “oftener”—in the hind than in the fore feet. Added to which is to be taken into account, the practice of clipping the fore shoes of the former at the toe, but not the hind; while cart and dray horses wear clips to the toes of *both* their fore and hind shoes. Coupling this with the facts above stated, it is impossible to refrain from the inference, that some relationship would appear to be established between the seedy toe and the toe-clip.

**PATHOLOGY.**—At first aspect, hardly any morbid phenomenon assumes a simpler form, or seems readier to admit of explanation, than seedy toe; and, yet, no sooner is the subject broached than opinions fall in upon us hardly any two of which are in all respects concordant.

Were the disease an attendant or a sequel of laminitis, or of any kind of inflammatory or other affection of the laminae, the fore foot would be more subject to it, certainly, than the hind; but it would not uniformly break out at one spot, and that spot the *bottom* (not either the top or the middle) of the toe. Animalculæ I have searched for in vain. Hot shoeing has, manifestly, nothing to do with it; since, if it had, one hoof, and any part of that hoof, would be as liable to it as another. For the same reason, it cannot be said to owe its origin to pressure or squeezing from the nails, or to hurt of any kind. Neither have I ever noticed malformation of the foot of any description.

It may be easy in this way to state objections to the various theoretical notions of the day—since such may be so called as observation confirmed by practice does not place its seal upon—but it is a difficult, if not in the present state of our know-

ledge an impossible, matter to render anything like a pathological explanation which shall have for its basis the acknowledged facts by which seedy toe is surrounded. I cannot divest my own mind of the connection there seems to subsist between the toe-clip and the disease; and in the absence of facts of a contrary tendency, and of a more convincing character than any I have yet heard, I must declare that seedy toe, in my opinion, has its origin in *pressure*, and that the toe-clip, in the generality of cases, appears to be the agent of such pressure. I do not mean to assert that a toe-clip will produce seedy toe in any but a hoof—from its dry, fragile, crumbly or *seedy* nature—*predisposed* to such detriment from wear or pressure; else would thousands of horses have seedy toe in lieu of the few who contract the disease. I had a horse of my own who, before he came into my possession, was continually having sanderacks, and at length had seedy toe, produced, I believe, by the clip operating on a dry, cracky, crumbly hoof. In the 24th volume of the *VETERINARIAN*, p. 687, will be found a communication from Mr. Brown, V.S., Whitefriars, London, whose opinion on the subject—and it is a *practical* one—is quite in concordance with my own. He says, “It arises from pressure of the sole (junction of sole with wall?) of the foot against the sole;” that farriers, in drawing out a clip, are apt to “leave a bulge on the under side,” which “by pressing against the sole of the foot, while the clip in front of the shoe is not allowing the toe of the crust to yield,” produces seedy toe. Does not, however, the cutting out of a place for the clip, and the burning practised in seating the shoe, in a measure counteract this?

But, supposing we should have hit upon the mysterious cause, how are we to account for the *spread* of the disease in a direct line upwards, towards the coronet, the margin of which it sometimes reaches, and how—still more difficult to explicate—for the *lateral* spread it sometimes takes? The only explanation I am capable of rendering is the following:—Knowing, as we do, that the hoof is a fibrous tissue, and that its fibres are tubular, and contain within their canals more or less medullary matter, from which they derive that property where-by they gain the appellation of *living horn*, I would say, that

pressure operated in bruising and breaking down this tubular structure, and so occasioned, what might be called, *mortification* of the horny fibre ; and that such mortification, once produced, made its way along the canal of the tube, up to the coronet even, and so caused the defalcation, from the decay resulting, we so generally meet with. Why the inner to the exclusion of the outer crust of the wall of the hoof should be so affected, arises, I should say, from the pressure operating more particularly upon the horny fibres of the wall next to the sole, as well as from the circumstances of those (the inner) fibres having canals large enough to contain medullary matters, which is not the case with the more minute or outer fibres. The coating of horn still adherent to the sensitive laminae in seedy toe, forming the inner boundary of the hollow, is not of a tubular but a *laminated* composition.

In reference to horses being known to exhibit seedy toe who have never worn shoes, I can only suppose that, under certain circumstances, contusion or pressure of the toe against the ground may have the same effect as the toe-clip is supposed to have. After all, however, it behoves me in honesty to confess my inability to offer any very satisfactory explanations of the various phenomena concomitant on seedy toe.

THE TREATMENT, so far as we can assist nature in her operations, is a simple affair.

THE SHOE MUST BE TAKEN OFF to enable us to ascertain what progress the disease has made, as well as to admit of the removal of such parts of the damaged hoof as it shall appear requisite or expedient to cut away. With a probe, or even with a common horse-nail,—a common substitute for a probe in the forge—the seedy and hollow parts may be explored. There may be nothing present but abstract seediness of the toe ; or, with the seediness there may be excavation of the wall, and this excavation may or may not reach to the coronet. It is our business to probe the length and breadth and depth of the hollow. The condition of parts being ascertained, the next consideration is, to what extent

THE UNDERMINED HORN OUGHT TO BE REMOVED. It is quite certain that no re-union can take place between the

under-run or outer crust and the inner crust, as we may call that layer of horn still coating the laminæ. Neither can this excavated portion of wall longer afford any direct support to the coffin bone, though it is still concurring, indirectly, with the lateral parts of the wall in sustaining the bone. Add to this, the expediency of exposure and eradication of the decayed parts of the hoof, with the view of arresting the progress of decay, and we have the indications before us by which our future proceeding ought to be guided. It is good practice to remove as much of the hollow crust as will enable us thoroughly to clear out the carious chamber, though in doing so, we should not cut away more of the horn in front than is compatible with leaving such a bond of union between the lateral portions of the wall as shall still serve as a firm stay to them in suspending the coffin bone, upon which rests the weight of the body. If we carry out cutting beyond this we do harm, inasmuch as we run the risk, through giving way of the wall, of letting down the coffin bone upon the sole. When the uniting shaft of horn left is but a narrow one, a tight ligature of wax-end around the hoof will assist in giving support. Exposure of the seedy caverns to the greatest possible extent is always good practice; though in the pursuit of it we must suffer ourselves to be restrained by the risk of so weakening the crust as to cause lameness, and thereby throwing him, perhaps for some length of time, out of work.

SHOULD LAMENESS RESULT from the sunk sole or clubbiness of wall which now and then succeeds the paring deemed requisite in such cases, and it be such as to prevent a horse working, even with any shoe we can put on, a blister upon the coronet becomes advisable, not only as being likely to relieve the lameness, but as tending at the same time to promote the secretion of horn requisite for a new wall, by the growing down in an integral condition of which can alone the hoof be rendered solid again, and the horse restored to soundness and to work.

THE SHOE BEST ADAPTED FOR A SEEDY TOE is one which restricts its bearing to the solid and resisting parts of the hoof, while it defends from injury the defective parts without imposing any bearing upon them. For the majority of cases

—for all, indeed, of much moment—a *bar-shoe* will be found the most advantageous, owing to the broad and firm bearing it has upon the frog and heels of the wall, and the consequent less necessity there is for it to, in the least, press upon the front of the wall. In slight or incipient cases it may be requisite only to modify the bearing of the shoe the horse has on his foot at the time.

Whatever shoe be worn, should there appear any indication of the wall sinking—or even disposition in it to sink,—support must be given to the sole. This is best effected by broadening the web of the shoe, and inserting underneath it either a plate of leather or gutta percha, or even common stopping and tow, according as seems most desirable.

AS FOR MEDICINAL APPLICATIONS to the chasm in the hoof, such as ointments and plasters and injections, &c., they are nowise calculated to work any benefit. They decay or rot, or whatever it may be, in the horny fibres, seems to have owed its origin to violence of some kind ; if the return of which be guarded against, and the decayed portions of horn be radically excised, and their proximate sound parts at the same time completely exposed, while proper precautions are taken in shoeing, the shelly wall will grow down from the coronet in a united and perfect condition, uninfluenced by any applications to the hoof: though, if such be used, the cure of the case will, for the want of understanding it, hardly fail to be attributed to them.





## INDEX TO THE FOUR VOLUMES.

---

### A.

**ABSCCESS**, i, 171  
**Abscess**, serous, i, 331  
     — causes of, i, 331  
     — treatment of, i, 331  
**Abstract** of cases in glands and farcy, iii, 337  
**Acute glands**, iii, 181  
     — founder, iv, 390  
     — laminitis, iv, 390  
**Adhesion**, i, 75  
**Adhesions** from pleurisy, ii, 123  
**Air**, i, 4  
     — cool and pure in glands, iii, 345  
     — in the heart, ii, 165  
     — passages, diseases of, ii, 8  
     — under inflammation, i, 97  
**Ala nasi**, swelled in glands, iii, 171  
**Aloes**, purgative action of, i, 109  
     — ordinary dose of, i, 110  
     — tardy action of, i, 112  
     — as an alternative, i, 124  
**Alterative Ball**, i, 325  
**Alteratives**, i, 122  
**Amaurosis**, iii, 128  
     — symptoms of, iii, 131  
     — treatment of, iii, 132  
     — after castration, ii, 426  
**Amputation** of the penis, ii, 385  
**Anæmia**, i, 21  
**Analysis** of discharge in glands, iii, 136  
**Anasarca**, i, 326  
     — symptoms of, i, 326  
     — causes of, i, 327  
     — treatment of, i, 328  
**Aneurism** of the aorta, ii, 168  
     — of the iliac artery, ii, 170  
**Animal body**, the, i, 8  
     — poisons in, i, 65

**Antimony** as an alterative, i, 124  
     — ointment in spavin, iv, 130  
**Antiphlogistic treatment** of farcy, iii, 347  
**Aorta**, aneurism of, ii, 168  
**Apoplexy**, iii, 22  
**Arachnoiditis**, iii, 12  
**Arm**, fracture of, i, 265  
**Artificial anus**, ventral, ii, 299  
**Arteriotomy** and venesection, i, 102  
**Ascaris lumbricoides**, ii, 262  
     — vermicularis, ii, 263  
**Ascites**, ii, 309  
     — symptoms of, ii, 309  
     — post-mortem of, ii, 311  
     — treatment of, ii, 312  
**Atmosphere**, states of, a cause of inflammation, i, 64  
**Auscultation** and percussion, ii, 66  
**Auscultation**, ii, 70  
     — immediate, ii, 71—  
     respiratory murmur of, ii, 71—  
     morbid sounds of, ii, 72—diminished murmur, ii, 72—absent murmur, ii, 72—augmented murmur, ii, 72—râles, or rattles, ii, 73—mucous râle, ii, 73—dry râle, ii, 74—bronchial respiration, ii, 74—in pulmonary emphysema, ii, 73—crepitous râle in, ii, 75—sibilous râle in, ii, 75—cavernous râle in, ii, 76—plural sounds, ii, 76

### B.

**Barytes** in farcy, iii, 350  
     — in glands, iii, 339  
**Belly**, punctured, i, 329  
     — swelled, i, 326  
**Biliary calculi**, ii, 328

- Bites, venomous, i, 281  
 Black oil for wounds, i, 176  
 Bleeding in inflammation, i, 98  
 ——— general, i, 99  
 ——— effects of, i, 100  
 ——— local, i, 103  
 ——— when required, i, 103  
 ——— instruments for, i, 105  
 ——— treatment after, i, 106  
 Blisters, i, 131  
 ——— recipe for, i, 131  
 Blisters, other, i, 132  
 ——— application of, i, 133  
 ——— use of, i, 133  
 ——— for inflammation, i, 134  
 ——— in spavin, iv, 129  
 ——— in navicularthrititis, iv, 180-2  
 Blistering infusion, i, 132  
 ——— ointment, i, 132  
 ——— tinctures, i, 132  
 Blood-letting in navicularthrititis, iv, 178  
 ——— in spavin, iv, 96  
 Blood-spavin, iv, 299  
 ——— a concomitant of bog-spavin, iv, 300  
 Blood, the, i, 10  
 ——— increased in inflammation, i, 59  
 Bog-spavin, iv, 294  
 ——— difference between it and bone spavin, iv, 295  
 ——— causes of, iv, 295  
 ——— difference between it and windgall, iv, 298  
 ——— not productive of lameness, iv, 298  
 ——— treatment for, iv, 299  
 Bots, ii, 213  
 ——— probable effects of, ii, 217  
 Brain, diseases of, iii, 1  
 ——— injuries of, iii, 5  
 ——— concussion of, iii, 5  
 ——— loss of substance of, iii, 9  
 Breast, swelled, i, 320  
 Broken down, iv, 350  
 Broken knees, i, 219  
 ——— nature of, i, 219  
 ——— simple, i, 220  
 ——— cicatrization of, i, 221  
 ——— mark left after, i, 221  
 Broken wind, ii, 125—detection and history of, ii, 126—continental opinions on, ii, 2, 127—Mr. Cherry's case of, ii, 130—emphysema the cause of, ii, 131—asthma compared with, ii, 135—Sewell and Dick's opinions on, ii, 136—development of, ii, 136—symptoms of, ii, 137—after the fullest investigation, ii, 139—detection by percussion and auscultation, ii, 140—treatment of, ii, 141—no cure for, ii, 144  
 Bronchitis, ii, 16—kinds of, ii, 16—causes of, ii, 16—symptoms of, ii, 17—epidemic, ii, 17—chronic, ii, 17—progress of, ii, 18—pathognomonic symptoms of, ii, 18—prognosis of, ii, 18—complicated forms of, ii, 18—pathology of, ii, 18—terminations of, ii, 19—treatment of, ii, 20  
 Bronchocele, ii, 53  
 ——— treatment of, ii, 254  
 Bronchotomy, i, 167  
 ——— tube for, i, 168  
 Bubonocele, ii, 279  
 Budding-iron, i, 173  
 Burns, i, 279  
 Bursæ, disease of, causing lameness, iv, 27  
 ——— mucosæ, diseases of, iv, 273  
 Button Farcy, iii, 311
- C.
- Canker, iv, 440  
 ——— symptoms of, iv, 443  
 ——— causes of, iv, 446  
 ——— pathology of, iv, 447  
 ——— treatment of, iv, 449  
 Calculi, salivary, ii, 181  
 ——— biliary, ii, 328  
 ——— urinary, ii, 356  
 ——— renal, ii, 357  
 ——— ureteral, ii, 358  
 ——— vesical, ii, 358  
 Calculous concretions, ii, 256  
 Calomel as a purge, i, 113  
 Cannon, fracture of, i, 268  
 Cantharides in farcy, iii, 350  
 Capillaries, condition of, in inflammation, i, 60  
 Capped hock, iv, 309  
 ——— cause of, iv, 313  
 ——— prevention of, iv, 314  
 ——— treatment for, iv, 314  
 ——— medical treatment of, iv, 318  
 Capped elbow, iv, 322  
 ——— cause of, iv, 324  
 ——— removal of, iv, 324  
 Capped knee, iv, 326  
 ——— cause of, iv, 327  
 ——— treatment of, iv, 328  
 Carcinoma of the spleen, ii, 333

- Carditis, ii, 160  
 Cartilage, collection of, in navicularthrititis, iv, 172  
 Caruncle, enlargement of, iii, 149  
 Castration, hernia of, ii, 291  
 Castration, ii, 396—best age for, ii, 397—methods of, ii, 398—preparation for, ii, 399—securing for, ii, 400—by cauterization, ii, 402—by compression, ii, 406—by ligature, ii, 410—by torsion, ii, 412—abnormal appearances in, ii, 416—hernia during, ii, 416—consequences of, ii, 417—hæmorrhage after, ii, 418—hernia after, ii, 420—peritonitis after, ii, 420—enteritis after, ii, 421—chamignon after, ii, 421—schirrus after, ii, 425—fistula after, ii, 425—gangrene after, ii, 426—tetanus after, ii, 426—amaurosis after, ii, 426—strangles after, ii, 427—farcy and glanders after, ii, 427  
 ———— schirrus after, ii, 425  
 ———— treatment for, ii, 425  
 Cataract from ophthalmia, iii, 86  
 Cataract, iii, 102—kinds and causes of, iii, 103—of ophthalmia, iii, 104—spontaneous, iii, 105—congenital, iii, 106—capsular, iii, 107—origin and formation of, iii, 107—absorbability of, iii, 108—conclusionary remarks on, iii, 120—vision enjoyed under, iii, 120—vision enjoyed under, iii, 122—remedies for, iii, 122—operation for, iii, 123  
 Catarrh, ii, 9  
 Catarrh or cold, cause of, ii, 10—kinds of, ii, 11—symptoms of, ii, 11—febrile, ii, 11—duration of, ii, 12—chronic, ii, 12—termination of, ii, 12—properties of, ii, 13—pathology of, ii, 13—treatment of, ii, 14—ditto, when severe, ii, 15—ditto for sore throat, ii, 15  
 Caustic, in spavin, iv, 90  
 Cautery, actual, i, 139—operation of, i, 140—use of, i, 140  
 Cayenne pepper in glanders, iii, 341  
 Champignon, ii, 421  
 ———— combined with schirrus, ii, 423  
 ———— treatment for, ii, 423  
 Character of inflammation, i, 84  
 Cheek, injury of, i, 185  
 Chemical excitants, a cause of inflammation, i, 64  
 Cherry, A., his observations on knee-joint lameness, iv, 245  
 Chisel, its employment in spavin, iv, 89  
 Choking, ii, 186  
 Chronic glanders, iii, 187  
 Chronic pneumonia, ii, 93  
 Cicatrization, i, 74  
 Clap of the back sinews, iv, 346  
 Clark, B., his account of bots, ii, 213  
 Clothing, under inflammation, i, 95  
 Coccyx, fracture of, i, 263  
 Coffin-bone, fracture of, i, 271  
 Cold and warm applications in inflammation, i, 127  
 Cold, or catarrh, ii, 9  
 Coleman's opinions on spavin, iv, 70  
 Colic, wind, ii, 197  
 Colic or gripes, ii, 234—symptoms of, ii, 234—diagnosis of, ii, 236—cause and seat of, ii, 237—treatment of, ii, 239  
 Coma, iii, 15  
 Concretions, calculous, ii, 256  
 ———— stercoraceous, ii, 256  
 Concretions in the stomach, ii, 222  
 Concussion of the brain, iii, 5  
 Condition, i, 14  
 Congenital hernia, ii, 282  
 Congestion, i, 15  
 ———— kinds of, i, 16  
 ———— sanguineous, i, 16  
 ———— parts subject to, i, 17, 18  
 ———— serous, i, 19  
 Congestive pneumonia, ii, 79  
 Congenital ophthalmia, iii, 72  
 Constitutional effects of inflammation, i, 83  
 Contagion of glanders, iii, 218  
 Contracted sinews, iv, 364  
 Contraction, its relation to navicularthrititis, iv, 141  
 Contraction (or hoof-bound), iv, 457  
 ———— causes of, iv, 460  
 ———— pure and mixed, iv, 465  
 ———— treatment of, iv, 469  
 ———— prevention of, iv, 467  
 Contused wounds, i, 178  
 Copaiba, balsam of, in glanders, iii, 340  
 Copper, sulphate of, in glanders, iii, 332  
 ———— biniodide of, in glanders, iii, 335  
 ———— sulphate and biniodide of, in farcy, iii, 350  
 Cornea, opacity of, iii, 75  
 Corn, iv, 483  
 ———— cause of, iv, 484  
 ———— pathology of, iv, 486  
 ———— treatment of, iv, 488

- Corn, prevention of, iv, 491  
 Coronet bone, fracture of, i, 270  
 Cough, ii, 29—differs from roaring,  
 ii, 29—pathology of, ii, 29—  
 causes of, ii, 30—idiopathic, ii, 30  
 —humid, dry, short, ii, 31—hollow  
 and intermittent, ii, 32—broken-  
 winded, ii, 32—tendency of, ii, 32  
 —treatment of, ii, 33—diet for, ii,  
 35  
 Counter-irritants, i, 130  
 Counter-irritation in glanders, iii,  
 344  
 ————— in spavin, iv, 93  
 Cracked or chapped heels, i, 312  
 ————— treatment of, i, 312  
 Cranium, fracture of, i, 253—treat-  
 ment of, i, 258  
 Creosote in glanders, iii, 342  
 Croton seed, as a purge, i, 114  
 Croton seed, expressed oil of, i, 115  
 ————— farina of, i, 115  
 Cubebs in glanders, iii, 341  
 Curb, iv, 332—nature of, iv, 334—  
 cause of, iv, 337—treatment of, iv,  
 339  
 Cystitis-Cystorrhœa, ii, 373
- D.
- Death of the patient, i, 50  
 Dentition, ii, 171  
 ————— effects of, ii, 173  
 Diabetes, ii, 356  
 Diaphragm, disease of, ii, 61  
 ————— spasm of, ii, 145  
 ————— symptoms and  
 causes of, ii, 146  
 ————— treatment of,  
 ii, 147  
 Diaphragm, rupture of, ii, 148  
 ————— after death, ii,  
 151  
 ————— symptoms of,  
 ii, 152  
 ————— relation to  
 broken wind, ii, 154  
 ————— rupture and hernia of,  
 ii, 304  
 Diaphragmatic hernia, ii, 302  
 Diarrhœa, ii, 267  
 ————— pathology of, ii, 268-9  
 ————— treatment of, ii, 270  
 Diet in farcy, iii, 348  
 ————— under inflammation, i, 96  
 Digitalis, i, 118  
 Dilatation, for vesical calculus, ii, 363  
 ————— of the heart, ii, 163  
 Discentient lotion, i, 128
- Disease, i, 28  
 ————— derivation and meaning of, i,  
 29  
 ————— division, seat, and nature of,  
 i, 30  
 ————— mostly consists in inflamma-  
 tion, i, 32  
 ————— the practical study of, i, 33  
 ————— clinical observations of, i, 33  
 ————— signs of, i, 34  
 ————— history and causes of, i, 37  
 ————— forms and progress of, i, 40  
 ————— kinds of, i, 41  
 ————— translation of, i, 44  
 ————— probable termination of, i, 44  
 ————— treatment of, i, 45  
 Diseases, number and names of, i, 42  
 ————— febrile, i, 142  
 ————— of the skin, i, 283  
 ————— of the cellular membrane,  
 i, 315  
 ————— of the air-passages, ii, 8  
 ————— of the lungs and pleura,  
 ii, 61  
 ————— of the heart and append-  
 ages, ii, 155  
 ————— of the teeth and pharynx,  
 ii, 171  
 ————— of the stomach, ii, 193  
 ————— of the intestines, ii, 224  
 ————— of the peritoneum, ii, 305  
 ————— of the liver and spleen, ii,  
 315  
 ————— of the urinary organs, ii, 336  
 ————— of the male organs, ii, 376  
 ————— of the female organs, ii, 389  
 ————— of the brain and nerves,  
 iii, 1  
 ————— of the eyes, iii, 69  
 ————— of the lymphatic system,  
 iii, 159  
 ————— consisting in lameness, iv, 1  
 Dislocation of the spine, i, 275  
 ————— of the shoulder, i, 276  
 ————— of the arm, i, 277  
 ————— of the hip, i, 277  
 ————— of the patella, i, 277  
 ————— of the fetlock, i, 279  
 Dislocations, i, 272  
 ————— causes of, i, 272  
 ————— symptoms of, i, 273  
 ————— treatment of, i, 273  
 ————— cure of, i, 274  
 ————— reduction of, i, 274  
 ————— retention of, i, 274  
 ————— counteractive measures  
 for, i, 275  
 ————— of particular joints, i, 275  
 Diuretic substances, i, 120



Diuretic balls, i, 121  
 Diuretics, i, 119  
 ——— with sedatives, i, 121  
 ——— mode of operation of, i, 122  
 Dropsy, i, 315  
 ——— division of, i, 315  
 ——— external, i, 316  
 ——— causes of, i, 317  
 ——— debility causes it, i, 317  
 ——— varieties of, i, 318  
 ——— in young horses, i, 318  
 ——— physis for, i, 319  
 Dysentery, ii, 272  
 ——— symptoms and causes of,  
 ii, 273  
 ——— treatment of, ii, 274  
 Dysury, ii, 374

## E.

Effusion in pleurisy, ii, 107—time  
 required for it, ii, 109  
 Elbow, capped, iv, 322.  
 ——— fracture of, i, 265  
 Elbow-joint lameness, iv, 229  
 ——— post-mortem  
 account, iv, 233  
 Emphysema in broken wind, ii, 131  
 ——— of the lungs, ii, 135  
 Encephalitis, iii, 16  
 Enlargement of the caruncle, iii, 149  
 Enteritis, ii, 245  
 ——— symptoms of, ii, 245  
 ——— diagnosis and causes of, ii,  
 247  
 ——— treatment of, 249  
 ——— after castration, ii, 421  
 Epidemic and endemic glanders, iii,  
 185  
 Epiplocele, ii, 284  
 Epistaxis, ii, 58  
 Ernes' instrument for neurotomy,  
 iv, 217  
 Eruptions, i, 284  
 ——— distinguished from farcy  
 buds, i, 285  
 ——— cause of, i, 285,  
 ——— treatment of, i, 285  
 Esophagotomy, ii, 190  
 Esophagus, diseases of, ii, 171  
 ——— structure of, ii, 183  
 Eye, injuries of, i, 181—worm in, iii,  
 133—ossification of, iii, 146  
 Eye-ball, injuries of, i, 182—cuts and  
 contusions of, i, 182  
 Eyelid, laceration of, i, 181; iii, 148  
 Eye-pit, fistula of, iii, 151  
 Eyes, diseases of, iii, 69  
 Excretories, the, i, 10  
 Exercise, i, 5

Exercise, walking, in farcy, iii, 348

## F.

Face, tumours upon, ii, 180  
 False quarter, i, 252  
 ——— remedy for, i, 253  
 ——— palliation of, i, 253  
 Farcy after castration, ii, 427  
 ———, water, i, 321  
 ——— iii, 303  
 ——— varieties of, iii, 303  
 ——— symptoms of, iii, 304  
 ——— stages of, iii, 307  
 ——— pustules in, iii, 307  
 ——— third stage of, iii, 308  
 ——— parts subject to, iii, 309  
 ——— button, iii, 311  
 ——— glandular swelling in, iii, 311  
 ——— diagnosis of, iii, 312  
 ——— progress of, iii, 313  
 ——— prognosis of, iii, 315  
 ——— causes of, iii, 316  
 ——— seat and nature of, iii, 318  
 ——— treatment of, iii, 345  
 ——— antiphlogistic, iii,  
 347  
 ——— walking exercise in, iii, 348  
 ——— diet proper for, iii, 348  
 ——— medicine proper for, iii, 349  
 ——— tonics in, iii, 350  
 ——— various medicines for, iii, 350  
 ——— local treatment of, iii, 351  
 Febrile catarrh, ii, 11  
 Feet, contracted, iv, 458  
 Femur, fracture of, 266  
 Fetlock windgall, iv, 290  
 ——— morbid change of,  
 iv, 293  
 ——— treatment of, iv, 293  
 ——— in front, iv, 306  
 Fetlock, dislocation of, i, 279  
 ——— joint, sprain of, iv, 359  
 Fetters to prevent kicking, iv, 317  
 Fever, i, 142  
 ——— Professor Coleman's opinion  
 on, i, 143  
 ——— derivation and definition of, i,  
 142  
 ——— nature and seat of, i, 143  
 ——— in horses, i, 144  
 ——— kinds of, i, 144  
 ——— common, i, 145  
 ——— idiopathic, i, 145  
 ——— symptoms of, i, 145  
 ——— precursory to other disease, i,  
 146  
 ——— causes of, i, 146  
 ——— prognosis of, i, 146

- Fever, from over-exertion, i, 146  
 — treatment of, i, 147  
 — mass (or medicine), i, 148  
 — sympathetic, i, 149  
 ————— cause of, i, 149  
 ————— treatment of, i, 149
- Fever in the feet, iv, 390
- Fevers, specific, i, 150  
 ————— influenzal, i, 150
- Fibrous membranes, inflammation of, i, 86
- Firing in navicularthrititis, iv, 184  
 — in spavin, iv, 97
- Fistulous parotid duct, i, 185—  
 causes of, i, 187—treatment for, i, 187—closure of the mouth of, i, 187—last but sure resource in, i, 188—author's method of cure, i, 188
- Fistula in the withers, i, 198—name of, i, 199—nature of, i, 200—state of tumour in, i, 201—suppuration in, i, 201—treatment of the abscess, i, 202—treatment of, by pressure, i, 203—hopeless cases of, i, 205  
 ————— in the scrotum, ii, 425  
 ————— of the eye-pit, iii, 151
- Fleam, patent, i, 106
- Flexor pedis tendon, sprain of, iv, 343  
 ————— metacarpi, sprain of, iv, 344  
 ————— metatarsi, sprain of, iv, 344  
 ————— tendons, sprain of, iv, 346  
 ————— metatarsi, rupture of, iv, 374
- Fomentations and poultices, i, 129
- Food, i, 5
- Foot, canker in, iv, 441  
 — observations on the lamenesses of, iv, 389  
 — pricked or wounded, i, 236  
 — pumice, iv, 424
- Fractures, i, 254—cause of, i, 255—kinds of, i, 255—symptoms of, i, 256—prognosis of, i, 256—hopeless cases of, i, 256—treatment of, i, 256—reduction of, i, 257—means for keeping reduced, i, 257—of particular bones, i, 258
- Fracture of the cranium, i, 258—of the orbit, i, 259—of the nasal bones, i, 259—of the superior maxillary bone, i, 260—of the lower jaw, i, 260—of the spine, i, 261—of the ribs, i, 262—of the pelvis, i, 263—of the bones of the tail, i, 263—of the scapula, i, 264—of the humerus, i, 264—of the arm, i, 265—of the elbow, i, 265—of the femur, i, 266—of the patella, i, 267—of the
- Fracture  
 tibia, i, 267—of the hock, i, 268—of the leg or cannon, i, 268—of the pastern, i, 269—of the sesamoid bones, i, 270—of the coronet bone, i, 270—of the coffin bone, i, 271—of the navicular bone, i, 272—of the skull, iii, 6
- Frauds practised in glanders, iii, 193
- Frog-pressure a cause of navicularthrititis? iv, 143
- Frog-seton in navicularthrititis, iv, 183
- Frush, iv, 429  
 ————— pathology of, iv, 434  
 ————— treatment of, iv, 436
- Fumigations in glanders, iii, 344
- Function, impairment of in inflammation, i, 57
- Fungus hæmatodes, iii, 139  
 ————— of the orbit, iii, 158
- G.
- Gait, the, in navicularthrititis, iv, 153
- Galls, saddle, i, 205—navel, i, 207
- Gangrene after castration, ii, 426
- Gastrocnemius, rupture of, iv, 375
- Gastritis, ii, 209—symptoms of, ii, 210—treatment of, 211
- Gastro-enteritis, ii, 225—duration and form of, ii, 226—complications of, ii, 227—autopsies of, ii, 228—hygienic treatment of, ii, 230—curative treatment of, ii, 231
- Generative organs, diseases of, ii, 376  
 ————— in the male, ii, 376  
 ————— in the female, ii, 389
- Glanders, iii, 161—symptoms of, iii, 162—constitutional, iii, 162—discharges in, iii, 164—analysis of discharges of, iii, 166—ulceration in, iii, 167—glandular swellings in, iii, 170—swelling of the nose in, iii, 171—predilection for the left side, iv, 172—diagnosis in, iii, 173—varieties of, iii, 180—acute, iii, 181—inoculated, iii, 181—3—typhoid, iii, 183—pulmonary, iii, 184—epidemic, iii, 185—subacute, iii, 186—chronic, iii, 187—insidious, iii, 188—different from gleet, iii, 192—frauds practised in, iii, 193—causes of, iii, 195—opinions on, iii, 198—classification of, iii, 218—contagion of, iii, 218—miasm of, iii, 240—other causes of, iii, 248—seat and nature of, iii, 252—authors' (ancient and modern) opinions thereon, iii, 252—322—treatment of, iii, 323—pro-

## Glanders.

- phylactic, iii, 323—therapeutic, iii, 327—ancient treatment of, iii, 327—modern, iii, 331—general, iii, 331—treated with copper, iii, 332—5—treated with iron—iii, 333—treated with cantharides, iii, 334—treated with iodine, iii, 335—author's treatment of, iii, 336—tabular account of, iii, 337—treated with barytes, and recovery under, iii, 339—treated with stavesacre, iii, 340—treated with copaiba, iii, 340—treated with cubebs, iii, 341—treated with cayenne, iii, 341—treated with injections, iii, 342—treated with creasote, iii, 342—treated with fumigations, iii, 344—treated with counter-irritation, iii, 344—cool and pure air in, iii, 345—after castration, iii, 427

## Glaucoma, iii, 126

## Gleet, distinguished from glanders, iii, 192

## Gonorrhœa, iii, 378

## Gorged stomach, ii, 195

- symptoms of, ii, 196
- treatment for, ii, 197

## Goulard's Lotion, i, 127

## Gowing's instrument for neurotomy, iv, 217

## Granulation, i, 73

- Grease, i, 300—symptoms of, i, 301—forms of, i, 301—parts subject to, i, 303—horses obnoxious to, i, 304—age and season, prevalent at, i, 304—causes of, i, 304—contagiousness of, i, 305—treatment of, i, 306—dressings for, i, 307—strong dressings for, i, 309—cases elucidative of treatment for, i, 310

## Grinders, sharp, remedy for, ii, 177

## Gripes or colic, ii, 234

## Groggy lameness, or grogginess, iv, 162

## Grooming, i, 6

## H.

## Hæmatodes, fungus, iii, 138

## Hæmaturia, ii, 355

## Hæmoptysis, ii, 123

- symptoms and treatment of, ii, 124

## Hair, i, 74

- Health, i, 1—transition from to disease, i, 8—signs of, i, 1—in a state of nature, i, 2—in a state of domestication, i, 3

## Heart, diseases of, ii, 155

- on the action of, ii, 155
- ossification of, ii, 165
- air in the, ii, 165
- rupture of, 167

## Heat, a symptom of inflammation, i, 53

- rationale of, i, 61

## Heel, windgall of, iv, 308

## Hellebore, i, 117

## Hæmorrhage, after castration, ii, 418

- from the nose, ii, 58
- from the lungs, ii, 123
- in wounds, i, 172

## Hemiplegia, iii, 32

## Hepatitis, acute, ii, 316

- lameness from, ii, 317
- causes of, ii, 318
- treatment of, ii, 319
- complicated, ii, 320
- chronic, ii, 321
- treatment of, ii, 323

## Hepato-peritonitis, ii, 319

## Hepaticization, i, 79

- Hernia, ii, 275—inguinal, ii, 276—scrotal, ii, 281—congenital, ii, 282—in geldings, ii, 287—strangulated, ii, 288—of castration, ii, 291—umbilical, ii, 293—ventral, ii, 295—diaphragmatic, ii, 302—during castration, ii, 416—after castration, ii, 420

## Hide-bound, i, 296

## Hip, dislocation of, i, 277

## Hip-joint lameness, iv, 225

- treatment of, iv, 227

## Hock, capped, iv, 309

- fracture of, i, 268
- windgall of, iv, 304

## Hoof-bound, or contraction, iv, 458

## Horses, young, regimen for, i, 318

- physicking, i, 319

## Humerus, fracture of, ii, 264

## Humeral pathology, i, 31

## Hydatids in the liver, ii, 328

## Hydrometra, ii, 393

## Hydrops pericardii, ii, 159

## Hydrothorax, ii, 112

- symptoms and diagnosis of, ii, 113

- treatment of, ii, 114

- tapping for, ii, 115

- not necessarily incurable, ii, 120

- treatment for, after

- tapping, ii, 122

## Hypertrophy, ii, 161

- symptoms of, ii, 162
- of the spleen, ii, 330

Hysteritis, ii, 391

Hysteria, ii, 392

### I.

Indigestion, ii, 205

——— symptoms of, ii, 206

——— treatment of, ii, 208

Induration, i, 79

Inflamed vein, i, 209—natural process, i, 299—origin of, i, 210—nature of, i, 210—termination of, i, 211—causes of, i, 212—from want of adhesion, i, 212

Inflammation, i, 52—origin of, i, 52—symptoms of, i, 53—theory of, i, 57—causes of, i, 63—progress of, i, 66—terminations of, i, 67—sympathetic, i, 66—spontaneous, i, 65—kinds of, i, 84—character and tendency of, i, 84—in mucous membranes, i, 85—in serous membranes, i, 85—differences in the above, i, 86—in fibrous membranes, i, 86—in synovial membranes, i, 87—in other structures, i, 87—state of body under, i, 87—a salutary process, i, 88—treatment of, i, 90—preparation, i, 93—medical treatment of, i, 98—local remedies for, i, 126

Inflammation in the vein, causes of, i, 214—apparent mystery in, i, 214—treatment of, i, 216—ligature for, i, 218

Inflammatory pneumonia, ii, 80

Influenza, i, 150—season prevalent in, i, 151—contagious or not, i, 151—symptoms of, i, 151—other symptoms of, i, 152—nature of, i, 153—treatment of, i, 153—tonics in, i, 154

Inguinal hernia, ii, 276—Girard's account of, ii, 279—taxis for, ii, 280—after castration, ii, 281—treatment for, ii, 284

Injury, i, 169—kinds of, i, 169

Injuries, mechanical, causes of inflammation, i, 63

Injuries of the eye, i, 181—mouth, tongue, and jaws, i, 183—lips and cheek, i, 185

Inoculated glands, iii, 181-3

Insidious glands, iii, 188

Internal diseases, ii, 1—at the adult period, ii, 2—according to age, ii, 3—tabular statement of, ii, 3—monthly account of, ii, 4—comparative fatality of, ii, 4—proportion of deaths from, ii, 5—treat-

Internal diseases

ment of, ii, 5—remedies for, ii, 6—external remedies, ii, 7—decision in practice in, ii, 7

Intestinal worms, ii, 259—production of, ii, 260—propagation of, ii, 261—symptoms of, ii, 261—kind of, ii, 262

Intestines, diseases of, ii, 224

——— tympany of, ii, 224

Intus-susception, ii, 253

Iodine in farcy, iii, 350

——— ointment in spavin, iv, 130

Iron, sulphate of, in glands, iii, 333—sulphate of, in farcy, iii, 350

Irritation, removal of, in inflammation, i, 94

Ischury, ii, 374

Itch, its identity with mange, i, 291

### J.

Jaundice, ii, 323

——— pathology and treatment of, ii, 324

Jaw, injury of, i, 184

——— lower, fracture of, i, 260

——— upper, fracture of, i, 260

Joints, diseases of causing lameness, iv, 27

——— inflammation of in foals, iv, 44

——— ulcerative disease of, iv, 45

——— ossified disease of, iv, 51

Joint-lameness, other, iv, 224

Joint, hip, lameness, iv, 229

——— elbow, lameness, iv, 225

——— shoulder, do. ix, 234

——— knee, do. iv, 244

### K.

Kicking, prevented by fetters, iv, 317

Knees, broken, i, 219

Knee, capped, iv, 326

——— windgall of, iv, 305—different kinds of, iv, 306

Knee-joint, open, i, 223—lameness, iv, 244—A. Cherry's observations on, iv, 245—treatment of, iv, 252

Kidneys, diseases of, ii, 336—mortified, ii, 340—hypertrophy of, ii, 340—scirrhus of, ii, 341—melanosis of, ii, 431

### L.

Lacerated wounds, i, 177

Laceration of the eye-lid, iii, 149

——— productive of lameness, iv, 371

Lachrymal passages, disease of, iii, 154  
 Lampas, ii, 174—disease or not, ii, 175—removal of, ii, 175—operation for, ii, 176  
 Lameness, general observations on, iv, 1—but a system of disease, iv, 2, produced by pain, &c., iv, 3—presence of, iv, 4—signs of, iv, 6—determination of, iv, 7—best shown in the trot, iv, 9—seat of, iv, 12—nature of, iv, 14—as opposed to soundness, iv, 16—classification of, iv, 26—from diseased joints and bursæ, iv, 27—rheumatic, iv, 35—from navicular-thritis, iv, 151  
 Laminitis, iv, 390—acute, iv, 394—symptoms of, iv, 395—diagnosis of, iv, 398—causes of, iv, 399—metastasis of, iv, 401—terminations of, iv, 403—treatment of, iv, 408—sub-acute, iv, 418  
 Laryngitis, ii, 22—symptoms of, ii, 22—chronic, ii, 23—causes and effects of, ii, 24—treatment of, ii, 24  
 Laxative medicine, i, 110  
 Leg, fracture of, i, 268  
 Leucorrhœa, ii, 389  
 Limbs, fracture of the, i, 264  
 Lips, injury of, i, 185  
 Lithotomy, ii, 364  
 Lithotripsy, ii, 363  
 Liver, diseases of, ii, 315—rupture of, ii, 325—cause of, ii, 326—symptoms, ii, 327  
 Locked jaw, iii, 45—muscles affected, iii, 46—division and kinds of, iii, 47—causes and effects of, iii, 48—subjects of, iii, 49—sympathetic, iii, 49—central, iii, 52—symptoms of, iii, 54—treatment of, iii, 57—consequences of, iii, 64  
 Lotion, Goulard's, i, 128  
 ——— evaporating, i, 128  
 ——— discutient, i, 128  
 Lousiness, i, 297  
 ——— lotions for, i, 298  
 Lungs, diseases of, ii, 61—observations on, ii, 61—predisposition to, ii, 62—causes of, ii, 62—diagnosis of, ii, 65  
 Lymphatic glands swelled in glanders, iii, 170  
 ——— in farcy, iii, 311  
 Lymphatics, diseases of, iii, 159

## M.

Mange, i, 289—symptoms of, i, 289—  
 —intrinsic nature of, i, 290—  
 —identity with itch, i, 291—communicability of, i, 291—contagiousness of, i, 292—causes of, i, 293—treatment of, i, 293—unguents for, i, 294—constitutional treatment, i, 295  
 Maxillary bone, fracture of, i, 260  
 Medical practice, i, 46  
 ——— agents, i, 47  
 ——— treatment of inflammation, i, 98  
 Medicine, form of, i, 47  
 ——— administration of, i, 48  
 Megrims, iii, 26  
 Melanosis of the eye, iii, 147  
 ——— of the spleen, ii, 333  
 Mercurial ointment in spavin, iv, 130  
 Mercury as an alterative, i, 126  
 ——— in farcy, iii, 350  
 Metastasis, i, 69  
 Metritis, ii, 391  
 Miasm of the stable, iii, 240  
 Mixed contraction, iv, 466  
 Mortification, i, 81  
 Mouth, injuries of, i, 183  
 ——— parrot, ii, 180  
 Mucous membranes, inflammation in, i, 85  
 Murmur in auscultation, ii, 71  
 Muscle, lameness from injury of, iv, 331  
 ——— rupture or laceration of, iv, 371

## N.

Nasal bones, fracture of, i, 259  
 ——— gleet, ii, 24  
 ——— treatment of, ii, 25  
 ——— distinguished from gland-  
 ——— er, ii, 192  
 Nasal polypus, ii, 55  
 Nauseating medicines, i, 117  
 Navel galls, i, 207  
 Navicular bone, fracture of, i, 272  
 Navicularthrits, iv, 131—definition and history of, iv, 131—Turner's original observation on, iv, 135—Bridges' and Moorcroft's observations, iv, 132—Colman's observations, iv, 134—Brauell's observations, iv, 139—relation to contraction, iv, 141—predisposition to, iv, 144—causes of, iv, 148—symptoms of, iv, 151—lameness from, iv, 151—relapse of, iv, 157—permanent lameness from, iv, 159—groggy



Navicularthritus  
 lameness from, iv, 162—pathology  
 of, iv, 167—treatment of, iv, 175  
 Needles, seton, i, 138  
 Nephritic disorder, signs of, ii, 342  
 Nephritis, acute, ii, 337  
 ———— chronic, ii, 339  
 Nerves, diseases of the, iii, 1  
 Neurotomy, iv, 185 — Professor  
 Sewell, the author of, iv, 185—  
 Moorcroft's claims to, iv, 186—ra-  
 tionale of, iv, 188—remote effects  
 of, iv, 189—success of, iv, 191—  
 insuccess of, iv, 195—subject for,  
 iv, 196—operation for, iv, 206—  
 the high operation for, iv, 214—  
 improvements in, iv, 215—subcu-  
 taneous, iv, 215—Ernes' instru-  
 ment for, iv, 217—Gowing's ditto,  
 iv, 217—regeneration after, iv, 219  
 —return of sensation after, iv, 220  
 —confined to one leg, iv, 221—  
 sequelæ of, iv, 222—question of  
 soundness after, iv, 223  
 Nitre, as an alterative, i, 125  
 Nose, hæmorrhage from, ii, 58  
 ———— cause, fatality, and  
 diagnosis of, ii, 59  
 ———— treatment of, ii,  
 60

## O.

Observations on the diseases of the  
 foot, iv, 389  
 Œstrus, or bot, ii, 213  
 Opacity of the cornea, iii, 75  
 Opened knee and other joints, i, 233  
 Opened knee joint, causes of, i, 223  
 —recent aspect of, i, 224—symp-  
 toms of, i, 224—locked jaw from,  
 i, 225—ankylosis from, i, 225—  
 treatment of, i, 226—treatment by  
 suspension, i, 228—constitutional  
 treatment of, i, 229—a new mode  
 of treatment, i, 229—another  
 novelty in treatment, i, 232  
 Opened other joints, i, 233  
 Ophthalmia, periodic, iii, 77—name,  
 iii, 78—symptoms, iii, 79—dura-  
 tion, iii, 82—intermissive, iii, 83  
 —relapses, iii, 84—structural  
 changes, iii, 85—cataract from, iii,  
 86—diagnosis, iii, 88—geldings  
 most subject to, iii, 89—eye most  
 subject to, iii, 89—causes of, iii,  
 89—hereditary, iii, 90—other  
 causes, iii, 92—local or constitu-  
 tional, iii, 96—treatment of, iii, 97

Ophthalmia conjunctiva, iii, 72  
 Orbit, fracture of, i, 259  
 ——— tumor and fungus of, iii, 158  
 Organic functions, the, i, 9  
 Oscheocele, ii, 281  
 Ossification, i, 79—of the heart, ii,  
 165—of the spleen, ii, 331—of the  
 eye, iii, 146  
 Ovaries, diseases of, ii, 393  
 Over-reaches, i, 242  
 ———— treatment of, i, 243

## P.

Pain in disease, i, 36—a symptom  
 of inflammation, i, 54—rationale  
 of, i, 62  
 Paralysis or palsy, iii, 31—kinds of,  
 iii, 31—symptoms of, iii, 32—  
 epidemic, iii, 33—partialis, iii, 34  
 —causes of, iii, 35—pathology of,  
 iii, 37—treatment of, iii, 41  
 Paracentesis thoracis, ii, 115  
 ———— the performance of, ii, 119  
 Paraphymosis, ii, 382  
 Parotid duct, fistulous, i, 185  
 Parrot mouth, iii, 180  
 Passages, lachrymal, disease of, iii,  
 154  
 Pastern fracture of, i, 269  
 Patella, dislocation of, i, 277  
 ——— fracture of, i, 267  
 Pathology humoral, i, 31  
 Pelvis, fracture of, i, 263  
 Penis, amputation of, ii, 385  
 Periosteotomy in spavin, iv, 91  
 Percussion and auscultation, ii, 66  
 Percussion of the nasal cavities, ii,  
 67—of the sinuses of the head, ii,  
 67—of the larynx, ii, 67—of the  
 windpipe, ii, 67—of the thorax, ii,  
 68  
 Percussion, practice of, ii, 68—pec-  
 toral sounds in, ii, 69—difference  
 in results of, ii, 69—sound ob-  
 tained by, ii, 69  
 Pericarditis, ii, 157—symptoms of,  
 ii, 158  
 Pericardii, hydrops, ii, 159  
 Pericardium, diseases of, ii, 155  
 Periodic ophthalmia, iii, 77  
 Peritonitis, acute, ii, 305—symptoms  
 of, ii, 306—treatment of, ii, 307—  
 chronic, ii, 308—after castration,  
 ii, 420  
 Pharynx, diseases of, ii, 171  
 Phleam, patent, i, 106  
 Phrenitis, iii, 16  
 Phthisis, ii, 94—predisposition to, ii,  
 95—symptoms of, ii, 96—post-

Phthisis  
 mortem appearances of, ii, 97—  
 tubercles in, ii, 98—treatment of,  
 ii, 99

Phymosis, ii, 381

Picking up a nail, i, 237—nature of  
 disease from, i, 237—treatment of,  
 i, 238,—when inflammation ap-  
 pears, i, 239—extreme cases of, i,  
 241

Plethora, i, 11—subjects of, i, 12—  
 forms of, i, 13

Pleura, alterations in structure of, ii,  
 111—diseases of, ii, 61—suppu-  
 ration and gangrene of, ii, 102

Pleurisy, ii, 101—kinds and subjects  
 of, ii, 102—causes and symptoms  
 of, ii, 103—progress and diagnosis  
 of, ii, 204—terminations of, ii, 105  
 —treatment of, ii, 105—effusion  
 in, ii, 107

Pleuro-pneumony, ii, 111—symp-  
 toms and treatment of, ii, 112

Pneumony, ii, 78—pathology of, ii,  
 78—division of, ii, 79—congestion,  
 ii, 79—blood-letting for, ii, 80

Pneumony, inflammatory, ii, 80—  
 symptoms of, ii, 80—progress and  
 signs of, ii, 82—terminations of, ii,  
 83—diagnosis of, ii, 84—treatment  
 of, ii, 85

Pneumony, sub-acute, ii, 88—patho-  
 logy of, ii, 89—metastasis of, ii, 91  
 —treatment of, ii, 92

Pneumony, chronic, ii, 93—symp-  
 toms and diagnosis of, ii, 93—ter-  
 minations and treatment of, ii, 94

Pointing in navicularthrits, iv, 165

Poll evil, i, 190—causes of, i, 191—  
 nature of, i, 192—peculiarities of,  
 i, 192—treatment of, i, 193—treat-  
 ment of the abscess in, i, 194—  
 the principles of cure in, i, 195—  
 dressings for, i, 196

Polypus, nasal, ii, 55—structure and  
 origin of, ii, 255—symptoms and  
 shape of, ii, 56—treatment and  
 operation for, ii, 56

Polypus, in the stomach, ii, 222

Polyuria, ii, 344—treatment of, ii,  
 347—symptoms of, ii, 347

Position of an inflamed part, i, 95

Poultices and fomentations, i, 129

Pricked or wounded foot, i, 236

Prophylactic treatment of glands,  
 iii, 323

————— of farcy, iii,  
 323

Prurigo, i, 284

Pulmonary glands, iii, 184

Pulse, state of, in disease, i, 35

Puncturation for windgall, iv, 288

Pumice foot, iv, 424

Pure contraction, iv, 465

Punctured belly, i, 329

———— wounds, i, 180

Purgative medicines, i, 109

Purge, action of, i, 107

———— preparation for, i, 111

Purges, in disease, i, 108

———— in health, i, 108

Purges, oily, i, 115

———— conclusory observations on, i,  
 116

Purging, i, 106

———— relieves inflammation, i,  
 107

Pustules, in farcy, iii, 307

## Q.

Quarter, false, i, 252

Quittor, i, 244—cause of, i, 244—  
 nature of, i, 245—simple form of,  
 i, 245—true and genuine, i, 246  
 —consequences of, i, 247—prog-  
 nosis of, i, 247—treatment of, i,  
 247—ordinary mode of cure of, i,  
 248—Newport's mode of cure of,  
 i, 249—other modes of cure of, i,  
 249—cauterization for, i, 249—  
 operation for the cure of, i, 250—  
 precautions in operating, i, 252—  
 dressings after operating, i, 252

## R.

Rabies, i, 280—symptoms of, i, 280  
 —interval of incubation, i, 281—  
 morbid appearances in, i, 281—  
 treatment of, i, 281

Râles in auscultation, ii, 73

Rasp, its employment in spavin, iv,  
 89

Redness, a symptom of inflammation,  
 i, 55—rationale of, i, 60

Renal calculi, ii, 357

Repose, in the treatment of inflam-  
 mation, i, 94

Reproduction, i, 77

Respiratory murmur, ii, 71

Resolution, i, 68

Respiration, state of, in disease, i,  
 35

Rest in spavin, iv, 94

Rheumatic lameness, iv, 35

Ribs, fracture of, i, 262—instrument  
 for, i, 262

Ringbone, i, 286—site and kinds of,  
 iv, 263—horses disposed to, iv,

## Ringbone

264—nature of, iv, 266—lameness not common in, iv, 267—treatment of, iv, 269

## Roarers, serviceable still, ii, 40

Roaring, ii, 36—definition and sound of, ii, 36—cause of the sound, ii, 37—kind and nature of the sound, ii, 37—when the sound is omitted, ii, 37—is it expiration or inspiration, ii, 38—tests of, ii, 38—tricks to conceal, ii, 39—unsoundness or not, ii, 39—mares less subject to, ii, 40—in man, ii, 40—pathology of, ii, 41—a consequence of disease, ii, 41—consists in thickened membrane, ii, 41—consists in ulceration, ii, 42—consists in metastasis, ii, 42—consists in bands of lymph, ii, 42—consists in ossification of the larynx, ii, 42—consists in distorted larynx, ii, 43—most common in harness horses, ii, 43—arises from reining-in, ii, 44—consists in wasting of muscles, ii, 44—consists in deformity of larynx, ii, 46—consists in mechanical obstruction, ii, 46—may be seated in the head, ii, 46—may arise from pulmonary compression, ii, 47—from nervous influence, ii, 47—from spasm, ii, 48—hereditary, ii, 49—treatment of, when inflammatory, ii, 51—excision of the bands of lymph, ii, 52—treatment when from reining-in, ii, 52—hopeless cases of, ii, 53—French treatment of, ii, 53

Round-bone lameness, iv, 225—treatment of, iv, 227

## Rowels and setons, i, 135

— insertion of, i, 130

## Rowelling scissors, i, 137

## Rowel, a prepared one, i, 137

Rupture of the heart, ii, 167—of the stomach, ii, 200—of the spleen, ii, 331

Rupture, productive of lameness, iv, 371—4

## S.

## Saddle-galls, i, 205

Salivary calculi, il, 181—treatment for, ii, 182

## Sanderack, iv, 473

— at the toe, iv, 476

— treatment for, iv, 478

## Sanguineous congestion, i, 14

Saw, its use in spavin, iv, 89

Scapula, fracture of, i, 264

## Scarlatina, ii, 27

— symptoms of, ii, 27

— treatment of, ii, 28

— cases of, ii, 28

## Scirrhus, i, 79

## Scrotal hernia, ii, 281

Scrotal hernia, operation for, ii, 285

Secondary effects of inflammation, i, 83

## Sedatives, i, 116

— with diuretics, i, 121

## Sedative medicines, i, 118

## Seedy toe, iv, 492

— pathology of, iv, 495

— treatment of, iv, 497

## Serosus abscess, i, 131

— congestion, i, 19

— membranes, inflammation in, i, 85

— apt to ail, ii, 111

## Sesamoid bones, fracture of, i, 270

Seton, frog, in navicularthrits, iv, 183

— needles, i, 183

— convenient places for insertion of, i, 189

— in spavin, iv, 123

— in windgall, iv, 288

## Setons and rowels, i, 135

— insertion of, i, 137

## Severe sprain, iv, 350

— treatment of, iv, 355

Sewell, the author of neurotomy, iv, 185

## Sheath, swelled, i, 326

## Shoeing, i, 6

## Shoulder, dislocation of, i, 276

## Shoulder-joint lameness, iv, 234—

French opinions on, iv, 236—

symptoms of, iv, 237—causes of,

iv, 239—treatment of, iv, 323

## Shoulder lameness, iv, 381

## Sinews, contracted, iv, 364

## Sitfasts, i, 207

## Skull, fracture of, iii, 6

Sloughing in wounds, i, 179

## Softening, i, 81

## Solidism, i, 32

Sore throat, treatment for, ii, 15

Soundness as opposed to lameness, iv, 16—to unsoundness, iv, 21

Soundness as related to warranty, iv, 23

Sounds from percussion, ii, 69

— bronchial and pulmonary, ii, 73

## Spasms, iii, 64

— symptoms of, iii, 67

- Spasms, treatment of, iii, 67  
 Spasm in colic, ii, 234  
 ——— of the diaphragm, ii, 145  
 Spavin, iv, 58—definition of, iv, 59  
 —site of, iv, 60—causes of, iv, 60  
 —symptoms of, iv, 63—detection of, iv, 63—lameness from, iv, 64  
 —pathology of, iv, 69—Professor Coleman's opinions on, iv, 70—treatment of, iv, 82—curability of, iv, 85—remedies for, iv, 88—another class of remedies for, iv, 121—bog spavin, iv, 294—different from bone spavin, iv, 295—blood spavin, iv, 299  
 Spine, dislocation of, i, 275  
 ——— fracture of, i, 261  
 Spleen, diseases of, ii, 315—hypertrophy of, ii, 330—ossification of, ii, 331—rupture of, ii, 331  
 Splenitis, ii, 328  
 Splint, iv, 252—definition and kinds of, iv, 253—site and nature of, iv, 254—pathology, iv, 255—cause of, iv, 255—rarely produces lameness, iv, 258—different from node, iv, 260—cutting from, iv, 261—soundness or unsoundness, iv, 261—treatment of, iv, 261  
 Sprain of the hind flexor pedis, iv, 343—of the flexor metacarpi, iv, 344—of the flexor metatarsi, iv, 344—of the flexor tendons, iv, 346—treatment of, iv, 353  
 ——— of the fetlock joint, iv, 359  
 Staggers, iii, 10—sleepy, iii, 15—mad, iii, 16  
 Staling, profuse, ii, 344  
 Stavesacre in glands, iii, 340  
 Stifle, dislocation of, i, 277—symptoms of, i, 278—reduction of, i, 278  
 Stimulating applications, i, 134  
 Stings, venomous, i, 281  
 Stomach, diseases of, ii, 193—observations on, ii, 193—staggers, ii, 195—tympany of, ii, 197—ruptured, ii, 200—concretions in, ii, 222—polypus in, ii, 222  
 Stone in the bladder, ii, 358  
 Strangles, i, 155—why classed with fever, i, 155—nature of, i, 155—peculiarities of, i, 160—contagiousness of, i, 160—age and season of prevalence, i, 160—causes of, i, 160—symptoms of, i, 161—submaxillary tumour, in, i, 162—repulsion of, i, 163—treatment of, i, 164—local treatment  
 Strangles  
 of, i, 164—fomentations and poultices in, i, 165—poultice, cloth for, i, 165—abscess in, points, i, 165—treatment of sequel of, i, 166—after castration, ii, 427  
 Strangulated hernia, operation for, ii, 288  
 Stricture of the œsophagus, ii, 183  
 Stringhalt, iv, 384—symptoms of, iv, 384—seat and nature of, iv, 385  
 Strangury, ii, 374  
 Strongylus, ii, 264  
 Sub-acute glands, iii, 186  
 Sub-acute laminitis, iv, 418  
 Sub-acute pneumonia, ii, 92  
 Suppuration, i, 70  
 Surfeit, i, 283  
 Suspensory ligament, sprain of, iv, 357  
 Suture, the twisted, i, 175  
 Sutures in wound, i, 174  
 ——— removal of, i, 175  
 ——— after the removal of, i, 175  
 Swelled belly, sheath, and breast, i, 326  
 ——— legs, i, 316—medicine for, i, 320  
 Swelling, a symptom of inflammation, i, 56—rationale of, i, 62  
 Symptoms, division of in disease, i, 36  
 Synovia, defective in navicularthrititis, iv, 171  
 Synovial membranes, inflammation in, i, 87  
 ——— sheaths, diseases of, iv, 273

## T.

- Tænia, ii, 264  
 Tail, fracture of, i, 263  
 Tapping for hydrothorax, ii, 115—treatment after, ii, 122  
 Teeth, diseases of, ii, 171—sharp and projecting, ii, 176—projecting, ii, 178—carious, ii, 179  
 Tendo Achillis, windgall of, iv, 304  
 Tendon, lameness from injury of, iv, 331—wounded, i, 234—divided, i, 235  
 Tenotomy, iv, 362—history of, iv, 363—operation of, iv, 367—treatment after, iv, 369—success of, iv, 369  
 Tetanus, iii, 45  
 ——— after castration, ii, 426  
 Tetter or ringworm, i, 286—furfuraceous, i, 287—other varieties of, i, 288

Therapeutic treatment of glanders, iii, 327—of farcy, iii, 345  
 Thirst, immoderate, ii, 345  
 Thorough-pin, iv, 301—causes of, iv, 302—pathology of, iv, 302—treatment of, iv, 304  
 Thrush (frush), iv, 429  
 Tibia, fracture of, i, 267  
 Toe-sanderack, iv, 476  
 — seedy, iv, 492  
 Tonic ball, i, 326  
 Tonics in farcy, iii, 350  
 — in influenza, i, 154  
 Tongue, injury of, i, 183  
 Tooth rasp, i, 185  
 Transition from nature to domesticity, i, 4—from health to disease, i, 8  
 Treads and over-reaches, i, 242—treatment of, i, 243  
 Treatment of inflammation, preparative, i, 93  
 Tumour of the orbit, iii, 158  
 Tumours on the face, ii, 180  
 Turner, J., author of navicularthritus, iv, 135  
 Tympany of the stomach, ii, 197—of the intestines, ii, 244  
 Typhoid glanders, iii, 183

## U

Ulceration, i, 71  
 — in glanders, iii, 167  
 Umbilical hernia, ii, 293  
 Unsoundness, iv, 21  
 Uretal calculi, ii, 358  
 Urethritis, ii, 378  
 Urinary calculi, ii, 356  
 — organs, diseases of, ii, 336  
 Urine balls, i, 119  
 — quantity and quality of, ii, 347  
 — albuminous, ii, 348  
 — pathology of, ii, 350  
 — treatment of, ii, 353  
 Urine, bloody, ii, 355

## V

Vaginitis, ii, 389  
 Vein, inflamed, i, 209  
 Venesection and arteriotomy, i, 102  
 Venomous bites and stings, i, 281  
 Ventral artificial anus, ii, 299  
 Ventral hernia, ii, 295—treatment of, ii, 297—Mr. Simonds' treatment, ii, 298  
 Vertigo, iii, 26  
 Vis medicatrix naturæ, i, 50

Vesical calculi, ii, 358—kinds of, ii, 359—composition of, ii, 359—symptoms of, ii, 360—examination for, ii, 361—treatment for, ii, 362—operations for, ii, 364-73  
 Vitiatio of the system, i, 23—through the alimentary canal, i, 24—through the water drunk, i, 26—through morbid matter, i, 26—through the air-passages, i, 26—through the skin, i, 27  
 Volvulus and intussusception, ii, 252

## W

Warm and cold applications in inflammation, i, 127  
 Warm applications in, i, 128  
 Warbles, i, 207  
 Warranty, iv, 23  
 Warts, i, 298—magnitude and structure of, i, 299—treatment for, i, 299—caustics for, i, 300  
 Water-farcy, i, 321—author's remarks on, i, 323—causes of, i, 323 termination of, i, 324—treatment of, i, 324  
 Wind colic, ii, 197  
 Windgall, iv, 274—derivation and application of, iv, 275—origin of, iv, 276—in young horses, iv, 277—in old and worked horses, iv, 277—causes of, iv, 279—pathology of, iv, 279—rarely producing lameness, iv, 283—site of, iv, 283 treatment of, iv, 284—of the fetlock, iv, 290—of the hock, iv, 304—of the knee, iv, 305—in front of the fetlock, iv, 306—of the heel, iv, 308  
 Windgalls, i, 20  
 Wortu in the eye, iii, 133  
 Worms, intestinal, ii, 259  
 — remedies for, ii, 265  
 — biliary, ii, 328  
 Wounded tendons, i, 234  
 — foot, i, 236  
 Wounds, i, 170—kind of, i, 170—incised, i, 170—case of incised, i, 171—hæmorrhage in, i, 172—removal of extraneous matter, i, 173—closure of, i, 173—sutures for, i, 174—black oil for, i, 176—lacerated, i, 177—hæmorrhage from lacerated, i, 176—treatment of, i, 178—contused, i, 178—sloughing in, i, 179—punctured, i, 180



The former part of the present Volume, illustrated by TEN COLOURED PLATES, treats of Spavin, Navicularthrititis, Neurotomy, Round-bone Lameness, Shoulder Lameness, Knee-joint Lameness, Splint, Ringbone, Coffin-joint Lameness, &c. &c. It has been favoured with the following testimonials:—

“In this book we find the most interesting subjects that can be brought before every horseman treated in the most scientific and intelligible manner. The author’s opinions, as well as those of many of the most eminent of the profession, are given to enlighten us upon circumstances that are often the cause of endless argument and expensive litigation. We can justly recommend this work to the perusal of both professionals and non-professionals.”—*Bell’s Life*, 4th March, 1849.

“The chapters are clearly and ably written, and the plates elucidate the various stages of disease. That the work will be in the possession of every veterinary surgeon in the army there cannot be a question: it should, and doubtless will, be procured by every cavalry officer, and indeed by every officer in the service who keeps horses. Too much cannot be said of the value of Mr. Percivall’s work. Such men reflect great credit on the service; and the veterinary surgeon of the British army will, following the good example of our author, take his position as a man of science.”—*British Army Despatch*, 9th March, 1849.

“We can only apply to this work, in its complete form, the same remarks that we made on it when appearing in detached articles in the pages of ‘The Veterinarian’—that it is the most valuable work on this important subject that was ever published. To the student of veterinary science it is indispensable, and no man who keeps a horse should be without it.”—*The Era*, 18th March, 1849.

“From the title-page we learn that Mr. Percivall is the author of various works, some of which we have met with, and may, without fear of being contradicted, pronounce to be among the best of the class to which they belong. Among them, however, we must place the present in the most foremost rank. It is superior to anything of the kind we have hitherto encountered, and different from anything which the generality of persons would anticipate to find in a horse-book.”—*Morning Post*.

“This work contains most valuable observations, almost in every page, on the subject of which it treats. The author shows himself a master of veterinary science, and we strongly recommend his book to the veterinary surgeon, and to others who have to do with horses. The volume is embellished with ten beautiful coloured lithographic drawings.”—*Medical Times*, 10th March, 1849.

“— The name of ‘Percivall,’ connected with that of ‘Author,’ is as well known to us as to the public, and where and when they have appeared together they have been affixed to works evincing deep professional research, extensive practical knowledge, and superior attainments of mind.” “As a matter of course, his treatise on ‘Lameness’ will be found in possession of every member of the profession; it will also find its way into the library or book-case of every man possessing a horse.”—*Sporting Magazine*, April, 1849.

“— We give to the present volume our warmest commendation, not for a moment doubting but that it will soon be in the hands of every horseman and every veterinary surgeon.”—*Veterinary Record*, April, 1849.

“Mr. Percivall is well known in the veterinary world, and also to the sphere of literature, by his excellent work on the ‘Anatomy of the Horse.’ The volume now under notice forms a worthy addendum to the one just named, and will place Mr. Percivall’s name still higher in the school of veterinary medicine.”—*The Weekly Dispatch*, 6th May, 1849.





RBC

Fairman Rogers

619.15

P413a

v. 4

pt. 2





